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THE

PICTURE OF INDIA;

GEOGRAPHICAL,

HISTORICAL & DESCRIPTIVE,

IN TWO VOLUMES,

VOL. I.

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LONDON,

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TO THE

RIGHT HONOURABLE

EDWARD

LORD ELLENBOROUGH,

PRESIDENT OF THE BOARD OF CONTROL

FOR INDIAN AFFAIRS,

&c. &c.

THE PICTURE OF INDIA

IS

RESPECTFULLY INSCRIBED

BY

THE AUTHOR.

SHACKELL AND BAYLIS, JOHNSON'S-COURT, FLEET-STREET.

PREFACE.

THE real importance of India—the exalted opinion which those who have not looked into the particulars entertain of its wealth—the mistakes as to what that wealth consists in—the great extent of country under the dominion of the British—the number of our countrymen that are holding, or expecting, situations there—the vast responsibility under which the Company have brought themselves, in the governing of so many persons, of whose characters they are ignorant, and the consequent ignorance in which the governors must be of the necessities and wants of the government— the anomalous fact, that Britons are not allowed permanently to settle in a country, of which the government is British—the inquiries that are already instituted, with regard to the renewal of the Company's charter, and the increasing

interest which every thing connected with India will acquire as the time of the actual debate on the renewal approaches,—all so far justify the publication of a book, which shall present the chief outlines of India in a small compass.

There is also another reason, which renders the appearance of such a book, in some degree, imperative. As the time alluded to approaches, there will, judging from past experience, be a great deal of writing and publishing about the subject; and, again judging from past experience, the quality of that writing will bear no reasonable proportion to the quantity. Upon both sides it will be party writing; and it will proceed upon British grounds, and be supported by temporary arguments and illustrations. For these reasons, it will not be conclusive. The chance is, that the parties may also argue different questions—the opponents of the Company, the question of trade; and its supporters, the question of government. Thus, though each were to use arguments that apply properly to that which they mean to support, they would not meet each other; and as the one would not be a cross-examination of the other,

the public would be bewildered by having two *ex-parte* statements, without any means of judging of either. THE PICTURE OF INDIA is, in so far as it goes, tendered as evidence.

But it is not upon British or temporary grounds that the question of India must be tried. India has, from the very remotest period of history, been nearly what it is at present; and it has all along been so different from England, both physically and morally, that no argument which applies in the one country will apply in the other; and, therefore, before an Englishman can be able to take any thing like a rational part in that which must ere long be one of the leading topics of conversation, he must know at least something about the natural and moral phenomena of India, and the causes upon which these depend. To view the matter minutely, it must be viewed philosophically; and as the data upon which that view must be grounded are different from those with which we are most familiar in Europe, he must attend a little to Indian philosophy.

It occurred to the author, that the present is a time at which the public will evince a desire

to obtain this information; that the temporary excitement will give a relish for a book of permanent information; and, therefore, leaving those who are interested to assert or argue, he has conceived that he would be more usefully employed in sketching an outline of the subject of dispute, in as clear a manner, and within as brief a space, as he possibly could.

India is so large, its history is so long, and the points in which it presents itself are so many and so diversified, that, to take one broad and general view of it, in such a manner as not to be at variance with some of the details, is very difficult, and, perhaps, impossible. That the author has made even a decent approximation to a view of this kind, it becomes not him to say; but if he has failed, the failure must be attributed wholly to his want of ability. The subject itself is one of the most interesting connected with man, or the planet which he inhabits; and the author has been attending to it for nearly thirty years; so that if his book be found not a good one, he has really no plea to urge in mitigation. But those who are the best qualified for judging of so varied and ex-

tensive a subject, are always the most candid to admit that two persons, against whom no serious charge either of ignorance or error can, with propriety, be brought, may each select as the most important, those points that appear but of minor importance to the other; and when there must be selection, this always takes off some of the edge of well-informed criticism.

There is another objection, which may be brought forward by rather a different description of judges; and that may be, that "The Picture of India should have been sketched in India." Now if a man could be found who had lived in *all* India, and lived in it ever since the days of Sesostris, the objection would have weight; but till such a man be found, the argument, in the case of a general outline, makes more the other way. In order to take a perfectly fair general view of any subject, it is quite indispensable that the parts of it should be all presented to the mind with the same vividness; and this can never be the case where the party depends upon observation in a few instances, and upon evidence in the greater number. This remark is not offered as any

presumptive evidence of the value of these volumes—that must be judged of by others; but it is offered to remove a prejudice which sometimes appears. "The Picture of India," then, is intended to furnish a general sketch of the country, as well to those who are to visit it, who are in it, or have returned, as to those who merely wish for information; and it appears at the present time, because it has the greater chance of being read.

In every part of it, the delineations are of course brief; but all the attention that the author could muster has been employed to make them forcible; and where the induction of particulars appeared long, the endeavour has been rather to prepare the reader for making the point, than to make it for him.

The analysis of the chapters will give a general idea of the contents and order of the book. The first volume contains the geography and natural history; and the second the historical and descriptive account of the people. In both, formality, and the pedantry that a very rigidly scientific form is very apt to assume, if not actually to possess, have been carefully

avoided, in order that the whole might have the appearance of what is usually called a "popular" book. On a subject which offers so many points for reflection, it is, however, not possible to get into the proper spirit without a little "expatiation" now and then; but the author hopes that those passages will not be found either too numerous or very presumptive. Those who are able to appreciate how delightful it would be to launch out into all the breadth and beauty of such a subject as India, will make some allowances for a man, who, in order that he may be more generally useful, restrains himself to a single line, where the subject would demand a volume, and even then be far from exhausted.

Bank of the Thames,
March, 1830.

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THE

PICTURE OF INDIA.

CHAPTER I.

INTRODUCTION.

THE BANYAN TREE.

From the earliest period of authenticated, and even of fabulous history, India has enjoyed a continuity of fame above any other region of the earth. It has been accounted the paradise of beauty, and the mine of wealth—the place

where all was ease, luxury, and splendour, and man was almost absolved from the primeval (salutary) curse, which dooms him, in less favoured lands, to earn his bread "in the sweat of his face." It is true that many of those who have thus described India have looked at it only through the long vista of two thousand miles, and that those who have had closer means of inspection have seen the wealth of India as accumulated by priests and rulers, and not in its diffusion among the people. This is a distinction which it is necessary to carry along in estimating all the representations of India, excepting those of a very recent date; and it is one which applies, not to the history of India only, but to that of all countries. The magnificence of temples and palaces, the glitter of diadems, the pomp of courts and processions, and the luxury of royal banquets, are no criteria of the general wealth or the actual resources of any country. In England, all these matters are now not only less magnificent, as compared with the general enjoyments of the people, than they were some centuries ago, but they are actually not half so splendid in themselves. The intellectual service of an English cathedral, how much soever it may be in accordance with reason and conducive to morality, is not half so dazzling to the sight,

as those exhibitions, the place of which, fortunately for the prosperity of the country, it has occupied. An English nobleman of the nineteenth century, travelling in his plain carriage, and with only two servants, would not impress one, ignorant of the whole state of matters, with half so exalted a notion of its wealth, as the progress of a baron of the middle ages, surrounded with five hundred belted knights, and the whole yeomen of a county, armed and following at his heels. The monarch of England, too, riding down with only a few guards, and in a costume not differing much from that of a private gentleman, with no accompaniment, save the congratulations of his people, unbidden and more felt than loud, to open the session of the British Senate, would give no idea that, in all this simple and unostentatious proceeding, there is far more of the essence of real power, than there ever was in the state of the hundred courts of India, or in those of Acbar or Aurungzebe, in the very zenith of their grandeur. Their wealth extended not beyond the court, and where the sword was not, their power was unknown; but the nations wait in anxious suspense for the speech of the British Sovereign, and that speech goes forth as a law, either directly or indirectly, over the whole civilized world; and both the moral and

the physical power that are ready to give it effect, when that becomes necessary, are abundantly recorded in the annals of every quarter of the globe When, therefore, we read or speak of the rulers of the east, we must not measure them by the standard of the west; for, if the real wealth that is distributed among the people of England or of France, were accumulated in the same manner as that of India once was, the latter would sink into comparative insignificance.

But, even when we take this precaution along with us, and thereby get the better of that exaggeration, of which there is a great deal even in this country, enough remains to render India, in almost every light in which we can view it, one of the most interesting portions of the earth's surface. Its natural features are, by turns, the most sublime and the most beautiful. Our loftiest mountains are but as mole-hills to its stupendous ridges, the summits of which are as lofty as Ben Nevis would be if piled on the top of Chimboraço. Our noblest rivers are but rills compared to its mighty streams, upon which navies can ride in the extremest drought, and which, in the rainy seasons, are seas, hundreds of miles in extent. The scenery is the most varied. In one place, there are dry and thirsty desarts, stretching

beyond the limits of vision; in others, fat meadows, where the reeds and grass are so luxuriant, that the rhinoceros and the elephant gambol unseen. Here, there are bold, naked rocks, crumbling into dust by the action of the atmosphere, and there, are dells and groves of the greatest beauty, and the richest foliage and perfume, interspersed with glowing lakes, and spotted with buildings of the most light and fantastic shapes. In one place, there are the richest fields, repaying the husbandman with several crops in the course of the year; and in another, there are thick jungles of forest, which no man can penetrate, and yet which dare not be cleared away, or the soil on which they grow would be washed into the ocean, and the lands behind, to which they are at once a pestilence and a defence, would share the same fate. The climate, too, presents the greatest variations. The summits of the mountains rise far above the limits of animal life and vegetation, into the regions of perennial snow; and the great rivers have their remote sources hung with icicles in the most ardent seasons, even where they issue from the earth in a state of ebullition. In other places the heat is excessive, even in situations far without the tropics, so that vegetation languishes and disappears, and Europeans are confined to their apartments,

in which they are compelled to have recourse to artificial currents of air for refrigeration. In places, however, which lie much nearer to the equator, the rain is, for six months of the year, so violent, that all out-door operations are nearly suspended, and the people are obliged to victual their houses in a manner almost similar to that in which a ship is victualled for a voyage of the same duration; and at the very season when this happens, (about 15° north latitude, near the west coast,) the heat is so intense at Calcutta, six hundred miles further to the north, but on the opposite side of the country, that pigeons are killed on the wing, and drop down dead in the streets, while a very brief exposure to the heat, with the head naked, is sufficient to bring on a fatal *coup de soleil.*

Temperature and humidity are the two great agents in the production of all terrestrial phenomena, whether these relate to the soil itself, or to the plants and animals which are produced and maintained upon the surface. Therefore, we may be prepared, in a country where the action of those great causes is so varied and so powerful, to expect corresponding results, and that the vegetable and the animal productions of India should be equally worthy of notice for their variety and for their

value. Such accordingly is the case: and from the very dawn of history, the productions of India have been among the chief objects of desire in the western world. The timbers, the gums, the perfumes, and the spices of India, the plumage of her birds, the tusks of her elephants, with countless other articles, have ministered to the splendour of other nations in all ages. Nay, it is by no means improbable that the more valuable of the garden fruits which are now cultivated so extensively and with so much assiduity in Europe, are natives of some part of the extensive region which is known by the general appellation of India. The peach and the nectarine have been traced to Persia; and notwithstanding that some have spoken about the cultivation of the sloe into the plum, and the crab into the apple, the more rational opinion seems to be, that both of these were at one time unknown to the western world, and were brought from the eastward of the Mediterranean.

The beauty and grandeur of some of those productions which have resisted transportation, or have become degenerated under less ardent skies, is very remarkable. Some of the palms of India are the most graceful, at the same time that they are the most useful of trees; the teak of the western mountains of India

excels in cohesion and durability, the best heart of oak; and there is one tree which is the symbol of India herself; that is, the banyan tree or Indian fig—*(ficus Indica)*, which though not more enduring in its timber when that is applied to use, than any other tree, yet actually possesses, in its verdant, and growing, and increasing state, a principle which defies the course of ordinary vegetable decay, and puts on the semblance of immortality. The giants of other forests endure for periods to which the life of man is but a span in comparison. The oak braves its three hundred years, and probably the chestnut and the cedar of Lebanon may add to their duration two centuries more; but their years are at last numbered; the trunk becomes too much indurated, and the roots too long and hard, for the circulation of the nutritious juices; the top in consequence withers, and the internal part of the trunk dries, decays, and becomes hollow: and though the bark and external layers of the wood struggle for a time, and put forth a few twigs or leaves, the storms level the ruin with the dust, or, in the case of the oak, the dry rot — *(xylostroma giganteum)* — and other *fungi* fasten upon the unventilated parts of the hollow, and drain the juices; and the remainder of the trunk wastes away, leaving only a little

circle of root for a few years, as the monument of its former majesty. Not so with the banyan tree. It is not dependant on a single root and trunk, the labour of which, and consequently their tendency to decay, increase with the increase of the tree. The branches divide the labour with the root that produced them. As soon as they have extended to that lateral distance which requires a prop to support them during the violence of the storms, they dart down perpendicular shoots, which instantly strike root in the ground, and at once give stability and send up nourishment to the tree, the original stem of which they in time emulate in diameter; and the whole tree stands a grove of three or four hundred massy stems, all ramified into one verdant canopy, so that no storm can root it up, and each contributes to the nourishment and life of the whole; while, as the branches, which derive fresh vigour from the virgin soil into which the new roots have struck, extend further in a lateral direction, hundreds of new shoots are in preparation, so that the nourishment and vitality of the mighty mass of vegetation are always increased in the full ratio of its size. Over such a tree the common lapse of time, and the casualties of the weather, violent as the latter are in India, have no power; and it can become a

prey only to the wantonness of man, the devouring fire, or the flood of some mighty river tearing away the earth in which it is rooted. Against the first of those casualties it has a security in the very constitution of Indian society, it being accounted a sacred tree. Nor is it in much danger from those accidental fires, which, during the season of drought, sometimes consume the forests of tropical countries, for it generally grows upon the rich and humid banks of the larger rivers, and it is only from the inundations of these that it can suffer. One tree of this species has, according to the accounts of the natives, vegetated upon the banks of the Nerbudda, within a short distance of the ruined city of Broach, which is about five and twenty miles from the confluence of the river with the Gulf of Cambay, for a period of three thousand years; and though a portion of it has been torn away by the floods of the river, all the remainder is in active vegetation, without any indication that it may, if not subjected to a similar casualty, double, triple, or increase by any indefinite number of times, its present age. Nor is there any just reason to suppose that the Indian account is exaggerated; the description given by Pliny would answer to the individual tree under consideration, and probably his information was, in great part, derived from what was handed down from the followers of Alexander,

who visited India more than two thousand years ago; and Milton's beautiful description, which was written after the moderns had visited India, (and Milton gives abundant evidence that he was in possession of all the geographical knowledge of his time, modern as well as ancient,) is little else than a literal translation of Pliny's, heightened by some poetical allusions.

Such a tree is the emblem of India itself; for its population have remained in the great mass unchanged, since a period more distant than that of the incursion of Alexander. The epoch of the invasion by Darius Hystaspes was about two hundred years earlier, and the manners of the people were then nearly the same as they are at the present day. Nor, though we cannot accurately fix the time, have we any reason to doubt the reality of the earlier visit by Sesostris, the Egyptian conqueror, at which, whatever may have been the precise time, the manners of the people of India were still the same, not only in a domestic point of view, but in the ease with which, when one battle was lost, they yielded to the events of conquest, and the rapidity with which they reverted to their former state when that had passed away.

To those who have no pecuniary interest in the present condition of India, as subject to

British power, this endurance of the population is the most interesting question,—indeed it is one of the most interesting in the whole history of the human race. In most other parts of the world, empire has followed empire, and nation has swept nation into oblivion: or the manners, and even the language, of the conquered, have wholly, or to a very great extent, given place to those of the conquerors. Of the glory of Egypt, and Babylon, and Persia, and Greece, nothing remains: and even the palaces of the Calipns of Bagdad, the Khans of Samarcand, and the Sovereigns of Ghizni, of Agra, and of Delhi, and of more recent monarchs, are in ruins. Most of the nations which furnished the armies that invaded and conquered India, have now no name upon the map in a land of their own; and the Arabs, the Bactrians, the Mogul Tartars, or whatsoever races came to settle in India, have thus felt the same decline, as without their natural boundaries, and are melting away. The Bhudists, who are understood to have, at one time, made an irruption from the north-east, and occupied and held sway in the valley of the Ganges, are now extinct there; their palaces are obliterated, their temples have become heaps, and attract only an occasional pilgrim from the mountains. The Mahommedans are

also vanishing, at a rate which rapidly increases, so that, in no very long period, they must become extinct. But the Hindû is the same. Like a flexible reed to the storm of the atmosphere, he bends level with the earth before every wind of conquest, come from whithersoever it may; but he is as elastic as he is flexible, and no sooner has the storm passed, than he is again erect and vigorous. The cause of this permanence in spite of changes,—this unaltered endurance amid conquests, more numerous, perhaps, than those that have visited any other country, is so singular and so much at variance with that which has taken place in other parts of the world, that it is eminently worthy of investigation.

It will probably be found, upon inquiry, that this permanence depends chiefly upon two circumstances,—the vast numbers of the Indian population, and those circumstances in their general laws and policy which make it a matter of very great indifference to the body of the people who may be their temporal ruler. It is sometimes said that the number of Europeans, of English in particular, that are in India, should operate a change upon the manners of the people: and, in the principal English towns, this may, to some extent at least, be the case; but the number of English resi-

dent in the country is not much greater in proportion to the whole population, than the number of Jews and other Orientals resident in England, is to the native population of that country; and their objects are nearly as foreign to any thing relative to what may be considered the native state of India, as the pursuits of those foreigners in England; and, therefore, even though they were as free to be affected in the one country as in the other, the influence in both should be nearly the same. But the natives of India are not only bound to the soil,—they are bound to it in a constant manner, through their successive generations. There are probably about six thousand Hindûs in the country for every European; three fourths of the latter are soldiers; and of the six thousand or seven thousand that remain, the greater part are about the factories, and even there—far more in the remote parts of the country—they are "*among* the people, but not of them." Indeed, as to any influence upon their manners, they are hardly *among* them. A Hindû, therefore, were he to assume the manners of an Englishman, would offend a million with whom he is connected, and by whom he would be despised for the change, while he would be only assimilated to one by the change, and that one would care very little for him.

It was this which caused the population of India to remain unchanged by the armies of Sesostris, Darius, and Alexander; it was this which rendered the conquests of Mahmoud in the beginning of the eleventh century, nothing more than a momentary subjugation of the native princes; and it was this which rendered the sway of the Moguls unstable, from the first irruption by the immediate descendants of Gingis Khan in 1242, to the final subversion of the Mogul empire toward the close of the eighteenth century, so very feeble and fluctuating. Indeed the governments of India, whether of native princes, or foreign invaders, have been unstable. Nor has this remarkable difference between the stability of the Indian population and the fluctuation of the powers by which they have been governed or influenced, been confined to eastern powers. The rise and fall of the commercial influence of those European nations that have, in succession, monopolised the commerce of India, have been as remarkable, and formed as great a contrast to what has taken place in other parts of the world. Where the swarthy natives of Africa, or the red men of America, have felt the power of Europeans, and have, as has usually been the case, faded or flitted before that power, the

original conqueror retains the possession, or its colonists have been transferred to another, or they have revolted, and became independent. But in India, the great body of the people have been indifferent to, and unaffected by, the changes; and when different European powers have struggled for the mastery of certain parts of the Indian coasts, the natives have, according to the different workings of intrigue, shown an equal disposition to side with, or against, either the one or the other. Nor, with the great body of them, has it appeared to be of much consequence whether they bore arms in defence of a native prince or against him; for of the many populous and valuable provinces, over which the dominion and influence of the British now extend, the greater part have been subjugated by armies of whom the majority were native Hindûs. In almost every other part of the world, and throughout the whole period of its history, we are in the habit of identifying nations with their governments, and regarding their fates as being so linked, that the rise or fall of the one involves that of the other as a matter of course. In modern Europe, we have only one remarkable exception to that, and that is the Jews. Nearly eighteen hundred years have elapsed since their Holy City was sacked, and their lands sold to the Romans; and both the Romans, and those

by whom they were subjugated and expelled, are gone, the former as a nation, and the latter as rulers; and during that long period, the Jews have been scattered among the other nations, without lands, without government, and many times exposed to the greatest obloquy and injustice; and yet, amid all the changes in the states and nations among whom they have sojourned, they have remained a separate and unchangeable people. They have done so, chiefly, because they have been unconnected with, and therefore indifferent to the governments by which they have been alternately tolerated and oppressed; and, upon the principle that like causes produce like results, the only one upon which we can reason, the same must have been the chief source of the stability of the Indian population, and the little influence that successive conquests have had upon their manners.

Most nations have had their waxings and their wanings,—their times of advancing in the arts, and of again falling back into comparative ignorance and barbarity; and in half the number of years to which the history of India extends, we have seen at least one of these changes in all civilized nations, and two or more of them in not a few. But during the whole period, we are not warranted in saying decidedly that India has advanced, or that it has fallen back. From

the splendid ruins that are met with in many parts of India,—the temples, of giant dimensions, excavated and moulded out of the solid rock, the magnificent forts, palaces, and temples, that are crumbling into ruin, and the canals that are decayed and destitute of water, some have inferred, that the Indians, as a whole people, have declined. But we have already adduced instances, in countries, the history of which is much more perfectly known, to show that the existence of such works is no proof of superior wealth diffused through the whole mass of the people, and consequently that these ruins alone are no evidence that the state of the whole people was better at any former period. When we find a splendid ruin in a country which is now depopulated—a Palmyra or a Baalbek, in an arid wilderness of sand,—or the Tower of Belus amid the desolation which now prevails on the banks of the Euphrates, we must conclude that such a country has deteriorated, and may seek the cause in physical or political changes. But when we find a ruin, however magnificent, in the midst of a dense population, we are forced to no such conclusion; and the question as to whether the people are politically better or worse, or have civilly advanced or fallen back, will depend upon the comparative quantity of their labour, that has been given up at the two periods under comparison. Now, at

all periods of Indian history to which we have any access, it really appears that the residue of the produce of their labour that has been left to the great body of the people has been very much the same—it has been a scanty supply of the cheapest and most homely fare, the very minimum of clothing and utensils, and habitations of the most rude and simple kind. As this is the general case now, we cannot say that the condition of the people has improved—there being no improvement below the *minimum*; and we have just as little reason to conclude that it has become worse: the enjoyments of the great body of the people are fixed by laws, which are the same now as they were in the days of Alexander, and for an antecedent period of which no one can tell the length; and therefore we may conclude, that they have been unvaried all the while. As respects the native rulers, there have of course been changes in their own wealth and that of their favourites, just as there have been in the dynasties and the relative power of these. But really, in so far as the comforts of the working Indian, or his stimulus to greater or more skilful labour is concerned, it appears to have all along been a matter of very great indifference whether he was plundered by a native rajah or bramin, or by any one else,—whether the accumulation was ex-

pended in carving the rock at Elephanta or Elora, or was conveyed across the Indus or the ocean. The readiness with which the Hindû has, on all occasions, shifted masters, shows that he does not, and cannot, very strongly feel the tie and the stimulus of country; and, other than that, there remains only the selfish or personal feeling, which, in men who, by the law of their country, are doomed to be vile and servile through all generations, without any offence on their part, or virtue or merit in those that lord it over them, is not likely to be very strong in favour of improvement of skill, which would bring with it no improvement in condition. In all reasonings and opinions that, in any way, bear upon the population of India, those considerations require to be taken along; because any conclusion attempted to be drawn from European facts and arguments only, or indeed from the condition of society in any country except India itself, would be erroneous and inapplicable.—Such are some of the most striking peculiarities in the physical and social state of India, which render it an object of the greatest interest to the student of nature and of man; but there are others which render it peculiarly interesting to the people of this country, both in a general and in a temporary point of view.

England justly lavs claim to the foremost rank among commercial nations. Her exports are more varied, and the products of her industry, generally speaking, better than those of any other country; her mercantile marine is more extensive, and her armed marine better adapted for protecting her trade all over the world. She has also colonies of her own in all latitudes and climates, from the extreme of cold, where mercury freezes, to that of heat, where a tallow candle cannot be used; and whatever of surplus produce these varied lands afford, she brings home, in part, and exchanges the rest, till she has an equal supply of the commodities of almost all countries. Therefore the chief commerce of such a country as India,—a country containing probably not much fewer than two hundred millions of people, and a country of which the productions have been celebrated in all ages,—is really an object of the utmost importance to her,—of far more importance than it would be to any other state, and probably of more than that of any single state would be to her.

It is true that, from what has been said of their condition, and what is known of its indisposition to change, the great body of the Indian population do not at present consume

much of the manufactures of this country: nor is it likely that the consumption of these among them would be soon, if ever, very great. But the more wealthy do consume a little, and, probably, in time the quantity might increase. Whether it might or not is no matter: the time has gone by when gold and silver, which, in the state of coin, are certainly the most convenient measures or representatives of wealth, were so identified with wealth itself, as to make people fancy that they were always parted with at a loss. The very reverse of that is, indeed, the case; the wages of labour, in this country, are generally paid in money—in gold or silver, or in that which (now at least) can always be converted into these without any loss; and in that case those who accumulate the wealth are the payers of the gold and silver, and not the receivers. Thus, though the people of India should be paid in those metals for all their commodities, it would not signify if those commodities brought a profit in that general market of the world to which Britain is in so superior a condition for resorting; and that they actually do so, we have proof from the very commencement of the annals of commerce. Therefore, in a general commercial point of view, the knowledge of India is of very great importance to this country.

In another point of view it is still more important. Not only the chief commerce, but the actual sovereignty of the greatest and most valuable portion of India, is in our hands, and we exercise a control over the rest, which, judging from the past, must, if the present state of matters continue, soon assume the name of that sovereignty, of which it is even now the reality. From the evidence of all past history, as well as from the issues of all Indian wars since the British power was what we may call consolidated in India, it may be assumed as true, that there is not a prince within the whole natural limits of the country, not a ruler over any portion of the two hundred millions of inhabitants, but really holds his throne, under whatever name it may be held, by sufferance of British power, and must render it up, upon whatever terms may be proposed, the very first time that that power is manifested against him. It avails nothing to say that patriotism, the spirit of the Indian people, would or may rise up; for in the course of more than two thousand years the people of that country have shown no patriotism; and, though we had not a good reason for arriving at the conclusion upon other grounds, that would be about as strong a proof as such cases admit of, that they have none to shew: and

why should they ?—it would be of no advantage to them. There might be intrigues, as there have been, arising from the ambition of native adventurers: and, as has been the case before, these might be fomented by other enemies of Britain in times of war; but "the sinews of war" are now under her controul, and without these, little could be done with a people who have been passive in their transfers from one conqueror to another, whether foreign or domestic, since the days of Sesostris.

This is an extent of empire, or rather a *numerical tale* of subjects, of which the annals of the world hardly afford a parallel. Russia, whose territorial extent is probably the greatest, does not number one third of it; and the greatest empire of antiquity, or that of the Moguls at its utmost extent, was probably still more inferior,—at least it is certain that when the Mogul emperor happened to be a weak man, half his provinces were in a state of revolt.

The mere control of such a multitude of human beings by a regular and resident sovereign, through the medium of ministers and officers who were of the nation, and had, as it were, a hereditary knowledge of their customs and dispositions, would be a most momentous matter, and one would be apt *à priori*

to look upon it, as a political machine that would fall to pieces by its own weight; and, if it were a colony, in which the natives, or descendants of the governing state, distant little short of a twenty thousand miles' voyage, were not to the native population, who know nothing about the governing country, in a rate so high as one to six thousand; and furthermore, if the said natives had been a great and a civilized people, for ages before the governing country had had a name among independent nations, the continuance of the colonial government would seem little short of a miracle.

But vast as the one of those modes of sway would appear, and miraculous as the other, they are not by half so vast or so singular as the government of what is called the British Empire in India. There is no sovereign there, and not so much as a viceroy; and the rulers of those two hundred millions have not necessarily, in virtue of the authority by which they rule, so much as a vote in the meanest parish vestry in England. They are twenty-four private gentlemen, who require to have no other status, name, or influence, in their own country, than the possession of as much stock in the company, and as much influence among the stockholders, as shall entitle and enable them to hold office as Directors of "the United

Company of Merchants of England trading to the East Indies." They have not the style of royal, or of honourable, or even of worshipful, like the companies that compose the livery of the City of London. They are simply "the United Company of Merchants trading to the East Indies." There is no law demanding that they shall have visited that country, that they know any one thing about its inhabitants, or even that they know in which hemisphere it lies; and yet they are the sovereigns of its two hundred millions of inhabitants, and, in the exercise of that sovereignty, have, without a controlling voice, or any quarter to which to appeal on the part of the natives, the command of a revenue fully as great as that which is required for the whole civil, military, and naval government of the British Empire, with all her colonies, as under the sceptre of her illustrious sovereign. This is commercial power, with a vengeance!—an *imperium in imperio*, which outdoes all the real and primary empires that ever existed. The twenty-four monarchs of India, if they derive not their exemption through some other means, are all liable to serve the most common parish offices in their native country, to obey the "unwashed artisans" that may happen to be in those offices, and severally to be held to bail, or shut up in

the king's prison, for a debt of twenty pounds and one farthing per sovereign. We must not, in the meantime, take upon us to say, that this is right, or that it is wrong,—that it is a blessing, or the reverse, to the two hundred millions of inhabitants of India, who pay their tribute and bow their necks in obedience to the four-and-twenty titleless (if not otherwise titled) men, and, forwards and back, have nearly forty thousand miles between the complaint and the remedy. We must have evidence before we can come to that conclusion in either of its opposite forms. But the case is so much an anomaly from all the forms and habits of government, to which the world has been accustomed, that it stands prominently forward as an "especial wonder." Why, if he were to come to this country, the whole of these four-and-twenty monarchs of the two hundred millions, would have to stand cap in hand to William Gustavus Frederick, the Sovereign Lord of Kniphausen, who sways his doughty sceptre over two thousand eight hundred and fifty-nine subjects, and has an army of eight-and-twenty troops, and who boasts of "a hundred head" of inhabitants in his capital city! Upon the ground of this anomaly alone, the question would call for the most grave and mature consideration; and if it were found just

as it should be, there is no seeing the end of the inferences that might be drawn from it.

But it is not in the abstract character of sovereigns of so vast a population, and as to how their deputed sway at such a distance may govern India, that the question comes before the people of this country. They have in fact greater powers than any of the sovereigns of Europe. For all the imperial state which they have acquired, and all the armament which they have for maintaining it, they are still the United Company of Merchants, and in that capacity have an influence on all the trade of India, outward and inward, and a perfect and close monopoly in the article of tea, which has become a necessary of life with almost every class of persons in the United Kingdom, and upon which a considerable public revenue depends. The question, therefore, involves the interests, both of the people and the government of the United Kingdom, or, to speak more correctly, it involves that joint and indivisible interest, which these have in common, and which cannot be so acted upon, by any cause whatever, as to injure the one without injuring the other to an equal extent. Such are the general reasons for calling the public attention to the subject of India, without any reference to time or temporary causes

But the temporary causes are also of considerable importance. All the power which the parties alluded to hold, great as it is beyond almost any other power that is held, or can be held, they hold under the British Legislature. That power was, after a great deal of opposition on the part of the public, and of some opposition, and a good deal of modification, on the part of the legislature and the executive, continued for twenty years certain, from and after the tenth of April, 1814. That is, if three years notice should be given to the company, and certain balances of monies paid to them any time after the tenth of April, 1831, their powers, both as sovereigns of India, and as a trading company, would be at an end. That time is approaching; and, from the momentous nature of the question, a great deal will in the interim be said upon both sides: and, in all probability, with so much strong feeling, that the real merits may be a little obscured by both. Those who set out with preconcerted opinions, either that the company should have its powers continued for a fresh term of years, or that those powers should now cease, are both apt, and perhaps equally apt, to mislead the public. In saying this we mean to fix no stigma upon either party; but it is accordant with general experience, even upon ques-

tions that are purely philosophical or speculative, and do not in any way involve the personal or pecuniary interests of the parties, that those who form an hypothesis before they come to state, or even to examine the facts, are almost sure to bend the facts so as to suit that hypothesis as much as possible; and if that has been found invariably the case in abstract questions, how much more must it be the case in a question of so much practical and personal interest, as that of the continuance or non-continuance of the sovereign power and commercial monopoly of the East India Company?

The object of the following chapters of these volumes is not so much to set before the reader the grounds upon which the question of the renewal of the charter must come to issue, as to collect and condense from all the various channels through which it is scattered, a clear and concise view of the whole of India, as it is in itself, as it has been in its relations to other countries, and as it must be viewed with reference to the particular question which must soon occupy the public mind in this country. There is already no want of books upon India —perhaps there are few countries respecting which they are so numerous; but there is no single one that gives a brief, yet general account, of the whole country; and though very

many of them are written with ability, it is doubtful whether an equal number be entitled to the character of perfect impartiality,—to that freedom from bias either way, which is absolutely necessary, when the public are to form their opinions respecting a question of the greatest national importance. As those who have actually visited India, have, in general, done so under the auspices of the Company, in some way or other, and have written either with a feeling in favour of their patrons, or with one against them after the patronage has been withdrawn, the opinions which they contain are to be received with caution, though the facts that they record with regard to the country may be perfectly correct. In what is stated in the following chapters there is no ground for bias, either way, and therefore, it is hoped, no misrepresentation will be found.

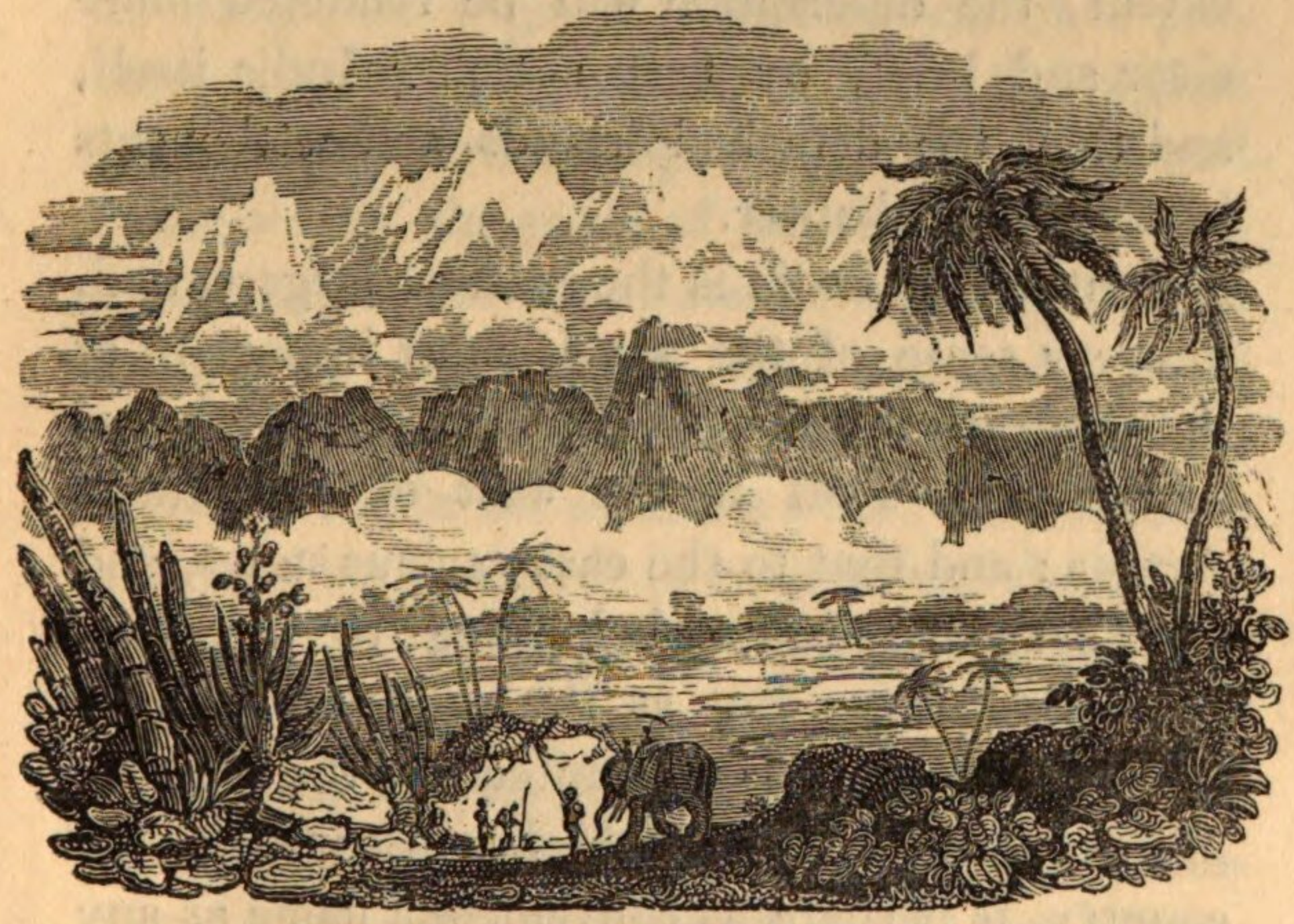
In treating a subject of this kind, with that brevity which is necessary for a general and popular view, there are two difficulties, both of which it is not very easy to avoid. Each place presents itself under a variety of aspects: such as its situation, its climate, its productions, and its inhabitants. If each place is viewed in all of these, in the succession of the places, the whole is frittered down to a gazetteer-like detail, and the general aspect, and

the conclusions to be drawn from it, are lost. On the other hand, it is difficult to make the general views sufficiently distinct without a good deal of real and much more apparent repetition: and it is hardly possible so to begin as that there shall not be some things mentioned in the very first chapter, of which the explanations cannot be given till afterwards. These difficulties are not mentioned as any apology for the execution of these volumes, but as inseparable from the nature of a descriptive work, which, while it contains the necessary portion of description, is intended to be brief, and, to some extent, philosophical.

CHAPTER II.

GEOGRAPHICAL POSITION — NATURAL DIVISIONS—MOUNTAINS.

HIMALAYA MOUNTAINS.



THE general term INDIA is variously applied by different geographers; and, in order to get a complete knowledge of all the relations of the British interests in the south of Asia, it will be necessary to use that term in its most

extended sense, including not only the portion of continental Asia to which the name of India now strictly and properly belongs, but also those other parts of the continent, and the islands, which wholly, or in part, belong to, or are under British influence, or are, in some way or other, connected with the British trade to the Indian seas. But as continental India is by far the most important portion, and as the others lie scattered over a comparatively wide extent, the description will be rendered more clear and brief, by first noticing India itself, and then the detached islands and settlements in a separate chapter.

Continental India is the central, largest, and, in every sense of the word, most important of the three peninsulas, in which Asia terminates southward. That to the west of it contains Arabia; and that to the east various states, and now some territories belonging to the East India Company; but as the southern part or termination of it is inhabited by the Malays, Malaya, that is, the Malay Peninsula, or country, is perhaps as convenient a name as any other. The name that it got from the older geographers was "India beyond the Ganges," which was by no means appropriate, as the Ganges is not the boundary of India, but, where it is an Indian river at all, flows wholly within

the territory. Neither does any part of that peninsula lie across the Ganges, with relation to India, but across the sea.

The position of India, and the nature of the surrounding surfaces, whether sea or land, require to be fully understood, in order to form a proper notion of those peculiarities of its climate, and that fertility of its soil, which have enabled it to support, through so long a course of ages, so dense a population, and which have, no doubt, in a great measure, tended to preserve it green and productive, amid the neglect and ruin which accompany internal wars, and under which the parts of Southern Asia which lie farther to the west have been changed from fertility to barrenness. The action of those surfaces will be explained when we come to notice the climate of India; but their relative positions with regard to each other should be borne in mind, as grand elements in the production of that.

India is an irregular four-sided figure, the sides of which are directed toward the south-east, north-east, north-west, and south-west. The south-west, south-east, and north-east sides are nearly, taking them on the average, straight lines of equal length, being each between one thousand four hundred and one thousand five hundred British miles. The north-west

side is shorter, being, on the straight line, little more than nine hundred miles. That makes the angle where the north-west and south-west sides meet, much less projecting than any of the others, and this makes the two approximate to one irregular western side. The largest line that can be drawn in India from north to south, is from a point in latitude 35° 30′ north, and longitude 73° east, southwards, inclining to the east, to Cape Comorin, the southmost extremity, in latitude 8° 4′ north, and longitude 77° 45′ east. The length of this line is, in round numbers, about one thousand nine hundred miles, and that does not differ much from the greatest extent in latitude, as a portion of the boundary in the north lies nearly in the direction of east and west. The longest line that can be drawn in a direction across, and nearly at right angles to this, is from Cape Monze, at the west part of the delta of the Indus, in longitude about 67°, along the parallel of latitude 25° north, to a point near Silhet, in the east part of the Province of Bengal, in about longitude 92°; and as the degree of longitude on this parallel may, in round numbers, be taken at sixty-three miles, the length of the line in round numbers will be about one thousand five hundred. If straight lines be drawn upon the maps, joining the respective points that terminate the length and breadth,

as above stated, those lines will, generally speaking, fall without the sides, so that the area of the four-sided figure which they form, will be greater than the surface of India. If we diminish the breadth by one hundred miles, the approximation will not be very wide of the truth: one thousand nine hundred miles in the one diagonal, and one thousand four hundred in the other, giving half the rectangle, or about one million three hundred thousand square miles for the whole of continental India. The surface has been computed from other data, some of which are, however, not much to be depended on; and from these the content has been stated at one million two hundred and eighty thousand miles, so that, in neither case, considering the extent of the surface, and the utter impossibility of perfect accuracy, until a trigonometrical survey shall be extended over the whole, can the approximation be very far from the truth.

The four sides of India, as marked out by the points from which we have estimated the extent of the country, have each a different description of boundary, although two of them be washed by the sea, and the other two bounded by land. The Bay of Bengal, that washes the south-eastern shore, is not so broad as the Arabian sea, to the waves of which the south-west side is exposed; and the countries that lie on the opposite shores of those seas, and

especially those that lie at their northern terminations, are of different characters. The arid lands of Arabia and Africa lie across the Arabian sea; and they are, together, too broad for allowing the Atlantic, on the west of Africa, to have any perceptible influence upon the climate of India. Along the northern shore of the Arabian sea, the country is also, generally speaking, of a dry and sterile character. Great part of the south and centre of Persia consists of sandy desarts, and, indeed, desarts of that description extend from the western confines of India, with but little interruption, all the way to the most westerly point of Africa, a distance little short of five thousand miles. Thus, though there be a considerable extent of sea on the west of India, while the sea continues its boundary, the character of the land to the northward of that sea is calculated to prevent the supply of humidity, until the air is cooled by mountains of very considerable elevation. This will be found to account, in a satisfactory manner, for the sterile character of that portion of the country which lies immediately to the north-east of the Arabian sea.

The Bay of Bengal on the east is different. It is not anywhere so wide, and it narrows more toward its northern termination. The Malay Peninsula is very narrow toward the

south; nowhere of very great breadth; beyond it, with the exception of scattered islands, the broad Pacific extends to the shores of America, and the motion, both of the tidal wave and the atmospheric current, in that ocean, is westward, toward the Malay Peninsula. In general, that peninsula has a diversified surface, and abounds with forest trees and other vegetation. The land along the northern termination of the Bay of Bengal is also very different from that along the same coast of the Arabian sea. While the latter is an arid and unproductive country, the former is perhaps the most moist and luxuriant in vegetation in the world. From Balasore to Chittagong, a distance exceeding two hundred miles in a straight line, the country is one accumulation of mud swamps, covered with tall grasses, reeds, mangroves, and all manner of trees and plants that flourish in a marshy soil, so thickly matted together as to be impenetrable in most places, extending to a considerable distance inland, interspersed with the different streams and lagunes that are formed by the vast masses of water discharged by the Ganges and the Brahmapootra, and proof against all the heat and drought of a Bengal summer,—experiencing in fact only the falling of rain in torrents at one season of the year, and the raising of the water by evaporation,

like the steam of a mighty cauldron, at another. These circumstances tend to give the portion of India that lies north-west of the Bay of Bengal, a very different character from that which lies north-east of the Arabian sea.

The land boundaries have also their difference of character, and of influence upon the countries which they inclose. It has been mentioned that the north-west one toward the sea is desart. As it recedes inland, it becomes, in some places, better; but it is nowhere of great elevation; neither is the adjoining country one from which any quantity of rain can come. The only portions of water in that direction, which could have any influence upon the climate and fertility of north-western India, are the Caspian Sea, and the Lake of Aral, and as air from them would have to pass over intervening mountains and desarts, it cannot bring any humidity to India.

The remaining, or north-east side of the country, from the termination of the low and swampy grounds near the Bay of Bengal, is formed by mountains, everywhere so high as nearly to deprive the air of humidity, and, in some places, of the stupendous altitude of more than five miles perpendicular above the level of the sea. This giant ridge stands upon the confines to all the humidity which the winds waft

from the Indian Ocean, by the Arabian Sea and the Bay of Bengal, and so returns it back in those magnificent rivers that water the northern parts of India. Those mountains have, therefore, much influence on the climate and fertility of the whole country.

Such are the position, the extent, and the boundaries of this celebrated region, in a view merely geographical, as they affect its statistics and its climate; but, on examining its position upon the map, one cannot help perceiving that, in regard to communication, and consequently commercial intercourse, its situation is most advantageous. The extremity of the Persian Gulf is at no great distance from the Mediterranean, and that of the Red Sea is still nearer; so that by both of these routes, the whole south of Europe is open to it, with a very small extent of land carriage. These were the channels of the ancient commerce with India; and they continued to be the only ones till the adventurous spirit of the Portuguese found the passage round the Cape of Good Hope. That passage forms a safe communication with the west of Africa and Europe, and the whole of the east of America. The passage round the Malay Peninsula forms, in like manner, a communication with the Oriental Islands, with the whole east of Asia, including the im-

portant countries of China and Japan, with the scattered islands in the Pacific, and with the whole western coast of the American continent. Both sides of the peninsular portion of India have easy, and almost equal, access to the eastern shore of Africa, to Arabia, and to the extensive continent of Australia. Nor are the communications toward the interior of Asia unworthy of notice. The distance to the Caspian Sea is not very great, and it is facilitated by the fact that the slopes of the interposing mountains, both ways, are in the hands of the same people. When the Caspian is once reached, there is a navigation through Russia, which may be extended to all the ports of the Baltic. Thus, when we look at the situation of India in a commercial point of view, we find that it is central among the nations; and, in the hands of a government that could concentrate its strength and wield its resources, it might obviously be made to combine the north, the south, the east, and the west. But India has never yet been a country of adventure, and trade with it has generally been carried on in the vessels of others, who in early times had to advance money to the artists, and wait till the commodities which they desired were prepared. In principle the case is the same still; but in practice it is altered: as what used to be done by the indi-

vidual trader after his arrival, is now done by agents—perhaps the expense of those agents may be among the reasons why the profits upon Indian commerce are so small now, compared with what they were when the British first embarked in the trade. When, in a subsequent chapter, we come to enumerate the leading productions and disposable commodities of India, we shall be better able to estimate the value of those channels of communication that have just been enumerated.

The natural divisions of India may, in a great measure, be arranged in the position of the boundaries. From the centre of the vast chain of mountains that form the land boundaries, two principal rivers have their origin: the Indus, which flows toward the Arabian Sea, near the western boundary; and the Ganges, which flows toward the Bay of Bengal, along the foot of the mountains, whose summits form the boundary. The course of the Indus, at first, among the mountains, is very winding; and the latter part is very much interspersed by desarts, so that the name of the Valley of the Indus can hardly be chosen as descriptive of the whole region through which that river flows. In the upper country there are many valleys, and in the lower there are not, strictly speaking, any valleys at all, but dreary wastes of sand,

with here and there a miserable village, where the people have to draw their scanty supply of brackish water from a depth of hundreds of feet. This desart stretches north-eastward into the central part of northern India, until it be met by the tributary streams of the Ganges, and terminates in the fertile grounds upon their banks. The Valley of the Ganges is more continuous, and better defined; and, with the exception of that of the Amazon, in South America, it is perhaps the most extensive valley on the face of the globe, while in fertility and population it exceeds every other. The whole length, from the mountains where the river has its remotest source, to the shore of the Bay of Bengal, is not less than one thousand miles, and the average breadth (as the breadth varies a great deal) may be taken at four hundred miles; so that this fine valley contains a surface of four hundred thousand square miles, the greater part of which is susceptible of cultivation of some sort or other, and much is fertile in an extreme degree. The north-eastern side of it is well defined, being formed by the secondary ridge of mountains, which runs parallel to the great central chain of the Himalaya, and is separated from that by the long, narrow, and elevated valley of Nepâl. But though the mountains on this side present one general line,

it must not be supposed that that line is one continuous and unbroken barrier, along the whole extent of the valley. Long ridges of mountains always consist of smaller ones placed across the direction of the principal, with valleys between them for the discharge of the rivers, and minor dells across these again for the discharge of the brooks and torrents. Thus the south-western slope of the mountains which form the north-east side of the Valley of the Ganges, is composed of secondary ridges, in general lying north-east and south-west, and from these the branches of the Ganges that fall in upon the eastern side, collect their waters. The western boundary of the valley is less definite. From the sources of the river to Patna, about four hundred miles, in a straight line, from the sea, it forms a sort of triangle, with the base on the Ganges, and the apex about five hundred miles to the westward, nearly on the same parallel with the mouth of the Indus, the north-west side skirting along the desart, and the south being formed by a cross ridge, which at that part of India extends, though in a very irregular line, from very near the bank of the Ganges, all the way to the Arabian Sea, in the Peninsula of Gujerat. Below this, the western portion of the valley is much narrower, not above one hundred miles in extent; and some of the remote branches of the

Ganges, alternate with those of other rivers, on the other sides of the elevated ridges that run toward the eastern sea. About one hundred miles below Patna, another cross ridge comes close to the river; and below that, all the way to the sea, there is an extent of country considerably flat. The countries on the Indus, the central desert, and the Valley of the Ganges, as they have been now noticed, comprise the whole of India, north of a line drawn from the Gulf of Cutch, eastward of the mouth of the Indus, to the mouth of the Ganges. This portion comprises that which is usually called India Proper, or Hindûst'han Proper, on the east, and the boundary of the Afghans in the north-west,—a part of which territory, as it at present exists, lies within the natural boundary of India, and is watered by the Indus and its branches,—while another portion lies to the north of the mountain boundary, and is watered by streams that flow north-west toward the Lake of Aral.

In the peninsular portion of India, that which lies to the south of a line drawn from the Gulf of Cutch to the Ganges, natural divisions are not so easily pointed out. In the part previously noticed, it has the features of part of a vast continent, features which are nowhere rivalled in their character, and, when once pointed out, they can neither be misun-

derstood nor forgotten. The ridge of mountains which gives rise to the great rivers of Northern India, may be regarded as the most elevated in Central Asia. Of the country which lies immediately to the north of their giant summits, not much indeed is known, though, from the little that is known, it may be concluded that it declines eastward in the direction of China, and northward to the Altaian mountains on the confines of Siberia, which latter are about a thousand miles north of the Himalaya, and of very inferior elevation. That country is elevated, and in part at least, it consists of sandy desarts; there must therefore be a reaction between it and the Indian mountains. Indeed the whole of the grand features of India, north of the line alluded to, prove that it must be connected with the central action of the continent.

The southern or peninsular part partakes more of the nature of an island: its features are not so bold; it is exposed to the action of no land, save the portion of India to the north, and therefore it must be more affected by local causes; and the difference of its climate and productions must depend chiefly upon the diversity of its own surface, and the difference of its position and aspect with regard to the sea. Its peculiar features are these:—From

the mouth of the Ganges to the mouth of the Krishna, in latitude about 16°, the east coast lies nearly in a straight line, in the direction of north-east and south-west. Several rivers of considerable size empty themselves into the Bay of Bengal along this line of coast; but between their outlets there are hills upon or near the coast; so that this part of India may be regarded as forming one great oval basin, the greatest length of which is from north-east to south-west, and of which the southern portion approaches near to the Arabian Sea, but is divided from it by high land. From the embouchure of the Krishna, a very irregular mountain barrier extends southward, at a varying distance from the coast, being at some places less than fifty miles from it, and at other places more than a hundred. The space between that mountain barrier and the sea is, for the most part, sandy and barren. A portion of it is usually styled the Coromandel coast. The mountain barrier gets the name of the Eastern Ghauts; but that name signifies the passes between the mountains, and not the mountains themselves. This mountain barrier is not very elevated, the highest points not exceeding three thousand feet above the level of the sea; but some parts of it are exceedingly rugged. It is interrupted at some places,

by breaks, through which the rivers from the interior of the Peninsula are discharged; and toward Cape Comorin, in the southern extremity, its situation is nearest to the western shore.

The elevated country within the mountain barrier gets the name of *Balaghaut*,—above the *Ghauts* (literally, above the passes, or *gates*), in opposition to the country between the mountains and the sea, which gets the name of *Payeenghaut*, or below the *gates*. The name of Balaghaut is given to the whole upland country from the river Ganges to Cape Comorin. From Cape Comorin another mountain barrier runs, parallel to the western shore, northward, for an extent of about nine hundred miles. It is nearer to the coast, higher, and less interrupted than the other, and gets the name of the Western Ghauts. The termination toward the north is near the Gulf of Cambay, and there, for a short distance, the general slope of the country is toward the west, where the valley of the river Nerbudda is formed between the elevation already alluded to as dividing Southern from Northern India, and the north boundary of the oval basin of which mention has been made, as sending its rivers to the Bay of Bengal. About 13° latitude the eastern and western Ghauts are con-

nected by a cross ridge, which lies in the direction of east and west; and the country does not immediately slope down to the north or the south of this ridge, but forms a table land, of considerable extent and elevation.

North of the Gulf of Cambay, the peninsula of Gujerat, beautifully diversified with hill and dale, extends toward the Gulf of Cutch. To the north of the latter Gulf, and extending northward to the great central desart, there is a very dreary marsh, the Rinn, measuring about two hundred and fifty miles in length, and seventy at its greatest breadth. Nothing can be more dreary than this portion of India. In the dry season it presents nothing but one glaring surface of crystallized salt, apparently firm and dry, though unpleasant and even painful to cross; but there are holes and quicksands below, which are full of danger. When the rains set in, this melancholy surface becomes covered with water, which melts the salt into a dirty brine, so that it is not easy to say at which season its appearance is the most revolting. This dreary salt marsh, as well as the desart to the north-east of it, is included in the northern or continental part of India.

It may save a longer recapitulation afterwards, to mention, in a single sentence, the natural divisions of the southern part of India.

The whole of the west coast, from Cape Comorin, presents a bold front to the sea, and the western Ghauts, which are very near the shore, rise sometimes to the height of at least six thousand feet, and their western slope, with the stripe of land between them and the sea, is called the Malabar coast. The country, for a very considerable distance inland, opens to the west, from the Gulf of Cambay, along the course of the river Nerbuddah; the hilly peninsula of Guzerat, follows on the north; and then the Gulf of Cutch, with the salt marsh of the Rinn beyond. The east coast presents to the Bay of Bengal an irregular line of hills, of less elevation than the Ghauts on the west; they begin to the westward of the most westerly mouth of the Ganges; are interrupted at the middle; approach the coast near Madras, where the centre forms a table land; farther south they recede westward; and in the vicinity of Cape Comorin, there is only one ridge of mountains, with the greatest portion of land on the eastern side. So that, with the exception of the portions mentioned on the west coast, this part of India contains the hilly district, south-west of the Ganges; the valleys of the central rivers forming a basin thence south to the table land; the sandy coast of Coromandel; the table land; and low

coast to the south-east, opposite the island of Ceylon.

The chief circumstances arising from this disposition of natural divisions, that will affect the climate, fertility, and healthiness of the country, are the opposition that the continuous ridges, such as the Ghauts, present to the periodical winds, and the rain or drought by which those winds may be found to be accompanied; the places where periodical winds may meet or oppose each other; and the difference of elevation above the level of the sea. It only remains, in this chapter, to give a more detailed account of the mountains, of which the chief positions have been already pointed out.

In doing this, it will be most convenient to begin in the north-west, where the great dividing ridge, between the northern and the southern waters, enters that part of the Afghan territory, which is naturally included within the Indian barrier, although that territory is not yet under the influence of the East India Company. Upon the map of Asia, this ridge of mountains may be traced, with some interruptions, of pass, desart, and table land, from the Dardanelles, south of Constantinople, to Behring's Strait, opposite the north-west of America. Indeed, the pass of the Dardanelles

is only an interruption, and, there is some reason to think, an interruption produced, during the present state of the globe, by the eruption of an immense body of water, that once covered a considerable part of the valley of the Danube, of Russia, and of Siberia, and united the Caspian, the Sea of Azoph, and the Black Sea into one mass of water. Therefore, the mountains under consideration are part of one great mountain formation, that girdles the old continent, from the south-west of Europe to the north-east of Asia, and is therefore the longest upon the globe.

As to India, however, it may be reckoned as beginning at Hindû Cosh, a great snowy summit, about seventy miles to the north-west of the city of Cabul, in Afghanistan, the altitude of which has not, so far as we have been able to ascertain, been measured. This peak is in latitude about 35°, and longitude about 68½° east. Thence, the chain stretches eastward, bending sometimes to the north, and sometimes to the south, but on the average nearly upon a parallel, to about longitude 76°, or for nearly four hundred British miles; and during the whole of that extent, it gets the name of Hindû Cosh, or the Indian Caucasus. Its summit forms the "water-shed," between the rivers that run north-west, and those that de-

scend to the Indus, during the greater part of the distance,—there being only two passages for rivers, one for the Kaushkar, about longitude 71°, and another for the Indus, about longitude 75°, both of which rivers flow toward the south. Those mountains are of great elevation, some of them being estimated at more than 20,000 feet, and the snow remains upon them throughout the whole season; but the barrier that they present, and the strong reflection of the mid-day sun from their sides, give to the valleys a very high temperature, and crops ripen and flocks are fed, and there are forests at an elevation which, even on the Andes, under the equator, would be too cold for being productive or even habitable. In the valleys, the thermometer shows an elevation of 113°; but in the light dry air of that Alpine region, that great heat does not appear to be injurious, or even disagreeable. The principal river that drains those mountains, to the west of the Indus, is the Cabul, which joins the Indus at the celebrated passage of Attock.

About the 76° of longitude, the chain bends to the south-east, and receives the name of Himalaya, or "the dwelling of snow," to which it is unusually entitled. Among high peaks of the Himalaya, in about latitude 31°, and longitude 81°, the Indus and its principal tributary,

the Sutledj, and the Ganges, and its principal branch, the Jumnah, rise, at no great distance from each other, nor yet far from the source of the Sanpoo, which rolls its stream through the mountain country of Thibet. Some of the mountains near the source of those rivers, have been ascertained to have an elevation exceeding 22,000 feet; but they are by no means the highest in the chain, though the point is, of course, the summit level of all the valleys of the rivers. At this part, the breadth of the chain is not great,—the extent, from what may be considered as the termination of the plains of India, to the commencement of those of Thibet, in passing northward, does not exceed eighty or one hundred miles.

It is after they have passed the sources of the great rivers, that those mighty mountains rise up, in all their grandeur, between the sources of the rivers Gogra and Gunduck, from longitude 81° to 83°. There, there is a succession of summits, ten or more, the altitudes of which have been measured, and each of them is considerably higher than Chimboraço, in the Andes: while Dhawalaghiri, or the white mountain, raises its head to the enormous elevation of more than 27,000 feet. These mighty masses are formed into an array across the direction of the chain, and divided, for a con-

siderable way by deep ravines. So far as has been observed, there is a peculiarity of formation common to them all; and it is a formation which, from the motion of the only winds that can act upon the mountains, those that come loaded with rain, we would be led to expect. The southern sides, those that are turned toward the Bay of Bengal, and of course pelted by the heavy rains which the south winds bring from that quarter, are smooth, and worked into something like débris and decomposition: while the opposite sides, which are sheltered from the fury of the elements, present all the perpendicular cliffs and rugged forms of the original rock.

Along the whole valley of the Ganges, those mountains retain a sublime elevation; though, as they advance toward the south-east, they become rather less lofty, and also less continuous. In absolute elevation, the secondary mountains that divide Nepâl from the great valley, are but trifling as compared with these; while the little lateral elevations, which stretch into the valley between the numerous rivers, and which are found so convenient for pasturage when the low lands are flooded, hardly deserve the name of hills. Beyond the swampy lands on the banks of the Brahmapootra, and the forests in which that river is supposed to

have its source, the great chain of the Himalaya has not been traced, though it is by no means unlikely that their ramifications may extend across China to the eastern sea, and down the Malay peninsula to the Strait of Malacca.

Vast as is the elevation of the Himalaya, one would be tempted to suppose that they are secondary to some more mighty formation, that once existed, or that still may exist, in the unexplored country to the north and west of Thibet. It is true, that, however skilful or scientific the observers may have been, their observations have been too few and hurried for any thing like a perfect knowledge of the structure of a ridge of mountains so extended and so elevated; and farther, as the ascent has not been nearer to the most elevated than twelve thousand feet, which is in itself the altitude of no inconsiderable mountain, there can be nothing but conjecture as to what may be the composition of those peaks that are clad with enduring snow; but the report is, that the principal rocks of which the Himalaya are composed, are not granite, in the mass, as is the case in the great ridges of other parts of the world; but that they are gneiss, with veins of granite. Veins of granite intersecting gneiss would be something new in geology, and go

far to unsettle the existing theories, which, after all that has been observed and done, may not be quite true. But we have been accustomed to look upon granite as the elder-born of rocks, and gneiss as the first product of its decomposition: and therefore what have been described as veins of granite, may be the primitive rock appearing through the coating of gneiss, with which it is encrusted, upon the lower part of the mountains; and when observers, that have more leisure, and views more expressly scientific, shall ascend a little higher, it may be that they shall find the composition of the Himalaya not to differ from that of the Alps or the Andes. To what extent those great mountains may be metalliferous, is also a matter for further investigation. Gold dust has been found, though only in small quantity, but probably in as great abundance as in the streams which flow from those parts of the Andes in which gold in the *lode* has been found. If, however, its native situation were found to be, comparatively, as elevated in those mountains as it is in the Andes, the working of it would, in all probability, be less profitable; and thus whoever may have the control of India, had, in all probability, better attend to the agriculture of the Valley of the Ganges, than seek for the precious metals among the summits of "the

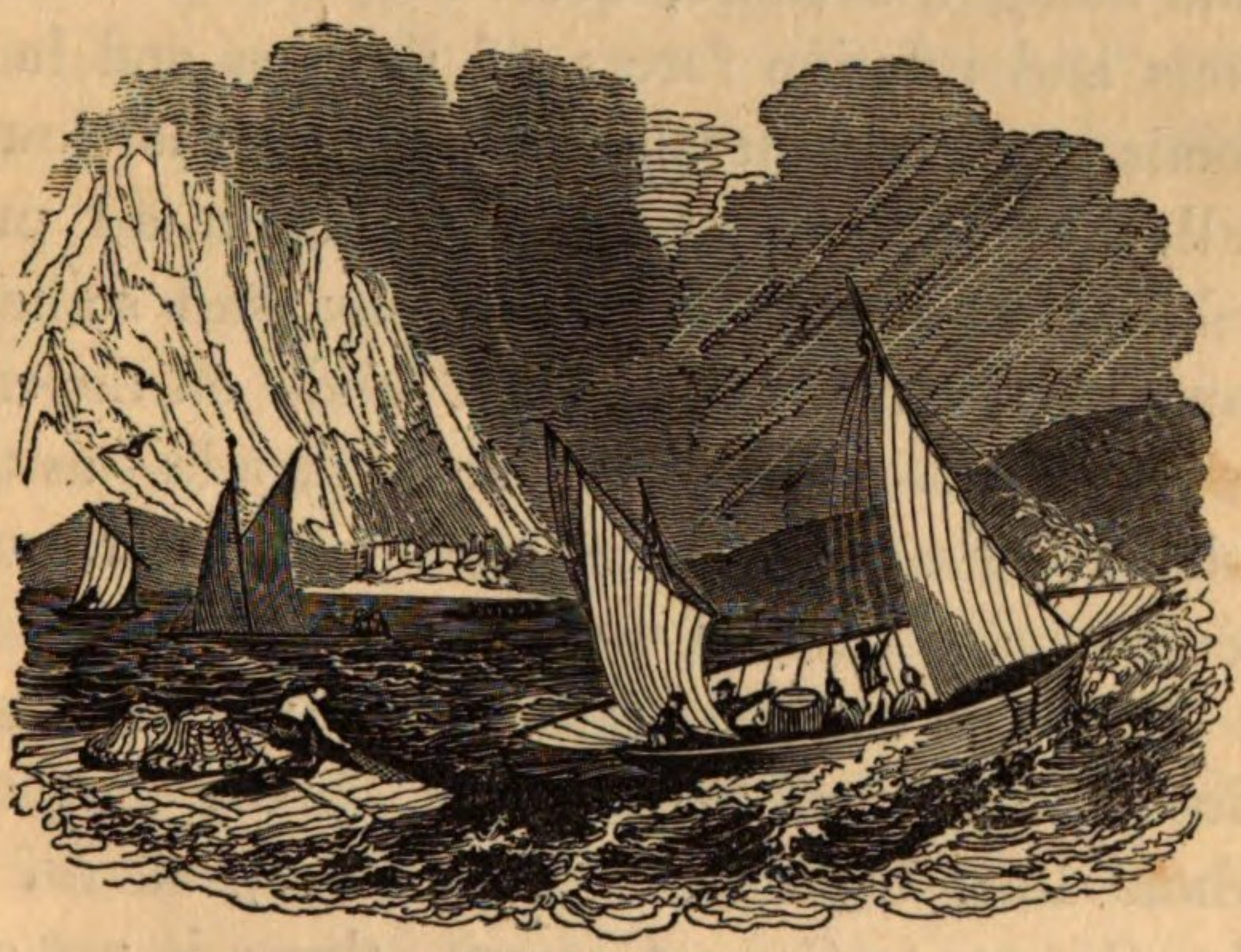
habitation of snow." After all the fables of the ancients, about gold dust bubbling up in the fountains of India, and being collected into heaps by the ants (they would much sooner collect dead flies and beetles), there remains a sort of evidence to prove that they knew there was gold dust in these mountains. Now, as the part of India with which they were best acquainted, was that which lies on the Indus, and as we have no proof that their knowledge of what they called the ridge of the Emodus, extended anything like so far as that part of the Himalaya which contains the more lofty summits, we are led to conclude that their gold, whether it bubbled up in fountains, or was obtained, as is usually the case, by washing the sand of the rivers,—whether it was accumulated by ants, or by the industry of human beings,—was, in all probability, obtained from that part of the Hindû Cosh, which lies to the north of the Indian part of the Afghan territory. Nothing, in short, appears to shew that mining for gold would be a more profitable occupation in India than it has been in America, where the profit has not been obtained from the mine, but from the privations of the miner, who has had slavery and starvation in the digging of it.

After the Himalaya, there are hardly any other mountains in India that will bear being

mentioned, as forming any thing like characteristic general features; and the hilly ranges that there are, will be better explained in treating of the sources of the rivers, or the topography of the different districts. Those minor elevations are, however, sometimes so steep and wild, that they cannot be crossed without the greatest difficulty; and there are, occasionally, detached masses of rock in countries which are otherwise nearly level. These are most frequent toward the west coast, where the natives constructed forts that were of great strength, before the introduction of the modern methods of attack.

CHAPTER III.

SHORES, ISLANDS, AND RIVERS.



BOMBAY HARBOUR, NORTHERN PART.

FEW countries, of equal extent, have their shores less interesting than India, in respect either of bays or of islands: though, in as far as internal communication is concerned, the rivers afford ample compensation, though these are

by no means so open to the sea as much smaller streams in other countries. This comparative inaccessibility of the interior from the shores, is, in a great measure, owing to the great fertility of the land, and the heavy rains; as the former accumulates great quantities of loose earth, and the latter wash it towards the sea, by the reaction of which it is thrown back, and forms a bar, a delta, or a portion of new land along the shore, according to the directions and relative forces of the sea and land floods. A considerable extent of the lower valleys of the two great rivers, has, in all probability, been formed in this way, and so have some parts at least of the flat lands on the east or Bay of Bengal side of the peninsula—as the soil is strongly impregnated with salt, and contains a number of marine remains.

The east coast is remarkable for the deficiency of natural harbours. Throughout the whole line, from the most easterly mouth of the Ganges to Cape Comorin, there is not one harbour for the accommodation of large vessels, and hardly a roadsted where they can ride in safety during the south-west monsoon.

On the north-east angle of the bay, there is a tolerable creek or harbour, at Islamabad, on the Karnaphali, or Chittagong river; but a vessel cannot easily leave it during the south-

west monsoon; and the country around, though well wooded, is swampy and pestilent. The whole coast of the delta of the Ganges, from the eastern or principal mouth to the Hoogly, which leads up to Calcutta, is one mass of mud banks, which are continually shifting, and among which there is seldom a channel that a vessel can trust. The whole of that coast is, therefore, useless for the purposes of navigation, or indeed for anything else, unless that the thick jungle with which it is covered prevents the soil from being washed away by the tide. In tropical countries, vegetation always appears to be an important agent in the formation of lands, where there are the joint actions of a land flood and the sea. When the river is flooded, those jungles act both as a dam and as a filter; in the one character they retain the water over the surface of the lands above, where it deposits a new soil, that adds greatly to the fertility; and in the other, they retain the floating mud and leaves, and prevent even the softest soil from being washed away. Even the Hoogly, which is the only mouth of the Ganges into which vessels of burden can enter, is both a difficult and a dangerous navigation; difficult on account of the number of banks, and those continually shifting; and dangerous because of the violence with which the river

flows downward when flooded, and the *bore* upward when the river is low. The difficulty begins at some distance from the land, at two banks, which are called the east and west sea reefs, which like all the other banks in this part of the bay, frequently alter their form and position. At Balasore, in latitude 21° 42′, there is a roadstead, and used to be a harbour, to which there was a considerable resort; but the harbour has been, to a very considerable extent, choked up. At this point, what may be called the north shore of the Bay of Bengal terminates—a shore which, for inutility for commercial purposes, forms a striking contrast to the entrances of most great rivers. But the riches to which the single opening of the Hoogly leads, and the noble stream of the Ganges itself, after the delta has been passed, more than compensate for the unpromising approach. Even the muddy shore, all pestilent as it is, is of some value in a commercial point of view—salt is manufactured by working the mud, and allowing the moisture to evaporate by the heat of the sun.

South of Balasore, the coast again becomes a salt jungle, over which the spring tides flow, and where of course there is no harbour, as the rivers are discharged by trifling openings, and, in some cases, ooze through the sand. On

this part of the coast, between the province of Orissa, and that of the Circars, there is a sort of bay, the Chilka Lake, which, except some narrow and shallow openings, has a low stripe of sandy ground between it and the sea. The greater part of it is shallow; and it can be navigated only by flat-bottomed boats, that draw very little water. Toward the north it is deeper, and rendered picturesque by a number of rocky islands; but as the depth does not extend to the sea, it is of little use for commercial purposes. A great deal of salt is, however, obtained from the shallows.

From the vicinity of the Chilka Lake to the mouths of the Godavery, the coast is of a bolder character; but there are no harbours, nor any safe anchorage during the south-west monsoon, until Coringa Bay be arrived at. That bay is in latitude 16° 49′, at the northern mouth of the Godavery. There is a bar across the entrance; but it is soft mud, so that a vessel may be forced through it, and when that has been accomplished, the bay is safe; indeed it is, with the exception of Masulipatam, a little farther south, near the mouth of the Krishna, the only place on the east coast of the peninsula, where there is smooth water during the south-west monsoon. None of these places, have, however, depth of water for admitting

vessels of more than two hundred or three hundred tons burden.

Upon the coast of Coromandel, further to the south, the surf breaks with great violence, and there is no place where a ship can find shelter. At Madras, the British capital of this part of India, ships cannot touch the shore, and very frequently they can hold no communication with it. During the months of October, November, and December, they cannot even remain in the roads with safety; nor can they, generally speaking, land in boats of European build at any season, the surf being so violent that any craft that does not yield to it is broken to pieces. The communication is usually made by country boats, and where the surf is very violent, by catamarans; and no ships attempt to land passengers, unless the signal from the beach-house warns them that it is safe. In favourable weather the ships' boats anchor just outside the surf, where the communication is continued to the land by the country boats. These are constructed of three planks, sewed together, with straw in the seams, so that they bend easily. Even with these light and buoyant vessels, a great deal of experience and determination are required, or they would be broken by the foaming surges which follow each other with great velocity and violence. The com-

mander of the boat stands up to beat time, which he does both by stamping and by roaring, to encourage the rowers. When the boat is in the trough of the surge, they pull backwards against the approaching ridge, in order to mount upon it before it breaks, and while they are upon its crest, it carries them to the shore with great velocity. When it breaks, they pull violently forward, in order to keep the way that they have made during the reflux; and the moment that the next approaching surge turns the water, they pull backwards again. Thus they keep advancing upon the crest of every successive wave, and pulling back a little in each interval, till they get so near the shore that the final surge flings them and their bark upon the dry land, along with the spray. It is by a passage of this kind that Europeans, of whatever sex, make a landing at Madras.

The catamaran is a still more desperate matter. The catamaran is formed of two or three logs of very light timber, lashed together, and having a cross-piece lashed across the stern. Two rowers, with paddles, embark, and literally bear their slender vessel through the surge. They are often unshipped, and dashed to a distance, but they are very dexterous in swimming to regain their places; and, though accidents do happen, they are by no means so

frequent as one would be led to suppose. The principal object of this singular and dangerous navigation is the conveyance of letters; but they also carry small quantities of provisions. A tall cap, plaited of the dry leaves of the palm-tree, so close as to be completely water-tight, is the place where they carry their letters; and if they have not the misfortune to meet with sharks, which are numerous in those seas, when the surf dashes them from the catamaran, they generally carry their despatches safe and uninjured by the water. Mere wages are not found enough to stimulate those adventurous navigators, more especially when they employ the catamaran as a life-boat, a use for which it is well adapted, for on those occasions they are rewarded with honorary medals. This violent surf must, of course, have a powerful action upon the shore, and it is supposed to have made considerable encroachments at some places, and left banks at others. Near the village of Mahabalipuram, about five-and-thirty miles to the south of Madras, where there are some excavated temples and rock sculptures, in a state of considerable preservation, the natives say that the surf breaks over the foundations of a great city, of the same name with the village, of which those sculptures were appendages. The existence of these

antiquities would lead us to the supposition, that there once had existed there a place of greater importance than any of which the ruins are now met with on land, and, from the distance at which the surf begins to break, the bottom must be shallow a considerable way off.

Though the surge probably beats with more violence at Madras, than at any point farther to the south, yet there is no harbour which vessels can enter in all the distance to Cape Comorin. The roadstead at Pondicherry is safer, and there are times at which ships' boats can land. Palk's Strait, between the south-east coast and Ceylon, is full of banks, and the opposite coast is low and sandy. The rise of the tide is very trifling, not more than two or three feet.

Cape Comorin is low and level; but, at the distance of not more than half a mile inland, there is the mountain of Komari, the termination of the Ghauts, rising to the height of about four thousand feet. It is from this mountain that the southern point of India takes its name: its position is, latitude 8° 4′ north, longitude 77° 45′ east. On glancing back at the particulars which have been stated, it will be perceived that the deficiency of accommodation for shipping, upon the eastern side of the Indian peninsula, is much greater than in any

other fertile country with which we are acquainted; and though many of the rivers are, during the rainy season, of sufficient violence and depth for inland navigation, there is some bar or impediment between each of them and the sea.

The west coast, from Cape Comorin to Cape Monze, west of the Indus, is of a very different character. It abounds in small bays, contains a number of commodious harbours, and the tide rises, in some places, as high as forty feet. From Cape Comorin northward, the hills are at no great distance from the coast; but there are fertile valleys between them; and the ports of Cochin and Paniany admit vessels of considerable burden. Between these two places there is a sort of inland navigation, formed by a series of salt lakes, which are protected from the sea by an irregular sandy reef. Calicut, a little farther to the north, is situated on a river, which can be ascended for a distance of one hundred miles in boats, and a very considerable trade is carried on with Arabia. The coast of Malabar extends from a little beyond 10° to about 12½° latitude, and besides Paniany and Calicut, contains the commodious port of Cannanore. It is from these ports that the name Malabar, which strictly belongs only to a very limited portion of the coast, has come to be applied to it generally. Northward, to about latitude 19°,

the coast still retains the same hilly character, though with occasional salt lakes and sands. Till lately it was very much infested by pirates, and there are a few still; but, since the British influence predominated over the little states on the coast, and the people were released from the tyranny of the sovereigns of the Mysore in the interior of the table land, the atrocities which once disgraced this part of India have very much diminished.

At 18° 56′ latitude is situated Bombay, the British capital of western India, and the best harbour which the British possess in those seas. The harbour, or bay, is formed between the main land and the islands of Salsette, Bombay, Elephanta, and Curanga. Salsette is eighteen miles long, and Bombay ten, and they are united by a causeway. The entrance to the bay within is accessible, by small ships only through the north, or Salsette channel; but by the south, it is navigable for ships of any burden; and the height of the tide, which is about seventeen feet at springs, adapts the place well for the building and repairing of large vessels.

North of Bombay the land is more of a champaign character, and gets so low near the coast as to be flooded during the rainy season. The chain of the Ghauts is entirely intercepted by the source of the river

Tuptee, on which the city of Surat is situated, and which traverses, in a direction of nearly from east to west, more than two-thirds of the breadth of the country. To the north of the Tuptee there is a ridge of hills, which separate the north side of the valley of that river from the valley of the Nerbudda; but they do not approach close to the coast, which continues low as far as the bottom of the Gulf of Cambay. That gulf lies on the east side of the peninsula of Gujerat, and extends about one hundred and fifty miles inland. Toward the town of Cambay, which is situated at its northern extremity, it becomes very shallow, a great part of it being left dry when the tide ebbs. As the projection of the Gujerat intercepts the course of the tide, the current flows into the Gulf of Cambay with very great velocity, and rises to the height of forty feet. It rushes in with so much violence as to occasion considerable danger. Nor is the part of the bottom which is left dry, when the tide ebbs, safe, for it is full of mud-banks and quicksands.

The coasts of the Gujerat are rather high on all the sides that present themselves to the sea; but the land at the head of the Gulf of Cutch, by which the Gujerat is bounded on the north, is very low, and communicates with one mouth of the Indus. There are some hills in

Cutch, and, what is not very common in India, they are said to be of volcanic formation; but the coast towards the gulf is low, and the district is everywhere surrounded by water or by salt marshes. The delta of the Indus, which closes the line of the west coast, is composed of sand banks, of much more sterile appearance than the sunderbunds of the Ganges in the Bay of Bengal. Such are the shores of India. In a geographical point of view, they do not offer much; nor does it appear, though in that respect they have not been very minutely examined, that they offer much more to the geologist. In the warm and humid air of India, there is a decomposing power which soon reduces to mud the exposed surface of the hardest rock, so that the boldest shores present the appearance of ruins.

But when we turn to the rivers of India, the case alters; and, with but few exceptions, the name of the Punjaub, or Land of Streams, which the natives apply to a small portion of the north, is descriptive of the whole country. The great rivers of India too, have this peculiarity, that the greater part of them "lie upon levels," or have so gentle declivities that they may be rendered available for the purposes of internal communication; and are, at all times, a sort of canals of Nature's making, and while

they are flooded, they have the character of inland seas. Most of the great rivers of the north, and they water a full half of all India, have acquired the greater part of their magnitude before they leave the great mountain ridge and enter the Indian territory; and, after that, though there be degrees of rapidity in their currents, there are none of them that present a velocity that can be looked upon as an obstacle to navigation: while the principal ones possess a depth of water capable of floating very large vessels. In the central parts, too, though the streams be of smaller dimensions, their general characters are nearly the same. Their branches are collected among hills in the early parts of their courses, and they flow, through by far the greater part of their lengths, across extensive valleys, with moderate velocity; and, instead of tearing up and destroying the country in the rainy season, as much smaller rivers would do, were their courses more confined, they, almost without exception, overflow the country. It is to this, more than to any thing else, that India is indebted for its great natural fertility. The rains in India are as violent as those in southern Africa, and the alternating droughts are as severe; but the rivers in southern Africa are rapid; therefore they have cut into the solid strata to such a depth

that, instead of watering the soil, they drain it. In the mountain districts they cut the fissures which, but for the deep chasm worn by the river, would produce springs; they exhaust the water through the porous strata under the soil; and when the heavy rain and the flood come, they sweep the soil and produce to the sea one common ruin. Hence in southern Africa, from the structure of the surface, both the heat and the humidity—which, were they to remain together and act in concert, would make that one of the most fertile countries upon the face of the earth—conspire to make it a desart. Before the heat comes, the moisture is altogether gone; and when the moisture again returns, the heat has burnt up everything, except those roots in the soil which can bear the extreme of drought. In such a country, too, there are no secondary rains, no clouds formed by evaporation from the surface of the land, and continuing to fall in refreshing showers, after the rain clouds, which the periodical winds bring from the sea, are exhausted.

But the form of the surface of India secures for it the opposite advantages. In those places to which the irrigation of the flood extends, there is an annual depositation of new soil, at the same time that the alluvion, to the whole of its depth, which is in some places very great, is

saturated with moisture, which continues to have a beneficial influence upon the vegetation during a considerable time after the rains have ceased. The secondary rains, too, which arise from the evaporation of the flooded lands, in so far tend to water the adjoining districts; and thus, in as far as fertility is concerned, the level courses of the great Indian rivers may be considered as very advantageous. There is yet another way in which this annual soaking of the surface, with the depositation of matter upon it, contributes to the wealth of India; and that is by the formation of saltpetre, or nitrate of potass, which is one of the staple products of the Valley of the Ganges. That salt is of great use in the arts, especially in the manufacture of gunpowder; and the natural circumstances that conspire to its formation in the Valley of the Ganges are almost the same as those that are brought together in the formation of an artificial nitre-bed. Animal matter for producing the nitrogen is contained in the accumulated mud, the number of small animals that perish during the rains being almost incredible. The waters also bring abundance of lime, which assists in the formation of the acid; and the decaying vegetable remains furnish the potass. By this means a fresh supply may be obtained from the same soil every season; and thus a

very valuable article of commerce is furnished directly by the flooding of the rivers, which, but for that operation, would be washed down to the sea.

The river to which the larger ones of northern India bear the greatest resemblance is the Nile, in Egypt; and we find that it, like them, has preserved the fertility of the land, which it more immediately irrigates by its floods. The inhabitants of both countries appear to have been aware of this from the remotest antiquity, as the rivers have a place in their mythologies. We are apt to pity the Hindû, when we hear of the divine honour that he pays to the sacred stream; but those very honours are a proof of the value of the river, however injudicious, or even absurd, the expression of gratitude for the enjoyment of them may be.

The Indus was the earliest known of all the Indian rivers. At the distance of nearly one thousand miles from its confluence with the Arabian Sea, it is a deep stream, seven or eight hundred feet across, and running with a rapid current, and vessels carrying two hundred tons may navigate its channel without the least interruption for more than seven hundred miles The Indus receives the greater part of its supply of water in the upper part of its course. It resembles a great tree, the bole of which is

lofty, but without lateral branches, yet which extends its topmost ramifications over nearly one thousand miles, the distance between the most easterly and the most westerly of its sources extending probably to that measure in longitude.

The whole course of this great river has not been traced with sufficient care; and the existing accounts of the lower part of it, after all its branches have been collected into one mighty flood, which rolls its waters rather unprofitably across a desart country, are a little contradictory. But they may have been all accurate enough at their respective dates, as the river appears often to shift its course in the loose and sandy ground. More than one thousand three hundred miles of the course of the Indus are known, and from the reports of the Chinese and Tartar inhabitants of the regions beyond the Hindû Cosh and the Himalaya, there is reason to suppose, that at the highest point where it has been seen by Europeans, the Indus has had a previous course among the mountains of between four hundred and five hundred miles, which will give it an entire length of nearly one thousand eight hundred miles. According to their accounts, the source of the Indus is in about 31° 30′ latitude, and 81° 30′ longitude, on the north or

Thibet side of the Cailas branch of the Himalaya. This branch separates from the other about latitude 32° and longitude 77°; and, so far as has been examined, stretches south-east, parallel to it, and at no great distance, for about four hundred miles, having the upper valley of the Sutledj between the two ridges. The mountains there are lofty, some of them being estimated at more than twenty-five thousand feet in elevation; but both the ridges and the valley are narrow, as the reported source of the Indus is not more than seventy miles from the north-east part of the province of Delhi. In all probability a continuation of the Cailas ridge extends northward from the source of the Indus, and divides that country on the west, which, for want of a better name, has been called Little Thibet, from Thibet properly so called, on the east. The course of the Indus is supposed to lie northward, inclining a little to west, through that mountainous country, for a distance of fully three hundred miles, to Ladhak (or Leh), the capital of a Thibetian province of the same name, in latitude about 34° 9′, and longitude 78° 20′. At the town of Draus, about one hundred and twenty miles south-west of Ladhak, and about forty north of the summit of the Hindû Cosh, the Indus is said to receive another considerable stream. From Draus, where the

course of the Indus is known, it rolls onward for about one hundred miles south-west, without receiving any great accession of water: at the end of that distance it passes the defile in the great chasm of the mountains, about longitude 75°; but its course is one hundred miles more, through a wild and mountainous country, and then fifty through lower hills before it reaches the plain of north-western India.

The course of the Indus has not been continuously traced through the upper country, neither is there any account of the opening by which it passes to the lower; but there is hardly an instance of a river of such length, and rolling so much water, passing through such a ridge of mountains; and, therefore, in a geographical point of view, the examination would be of considerable interest. One point is determined from what has already been observed: the country through which the Indus passes, both in the stream itself, and in the large branch which is said to join it from the north, about Ladhak, cannot be the arid and sterile desart that has sometimes been supposed. For at least one hundred and fifty miles of its course through the mountains, the Indus does not receive a single branch of any magnitude; the Abaseem, and the other streams which fall into it, on the south side of the mountains, above

Attock, are very trifling; and yet the river comes to Attock in the full swell of its flood, rising to the height of nearly forty feet above its level in the wet season, and converting a portion of the valley of Cuch, above Attock, into a temporary sea. For the fifty miles of its course through the plain, above Attock, the river expands into what may be regarded as a long and narrow lake, studded with many islands; but at the town of Attock, it contracts within a space of seven hundred and eighty feet, but is very rapid. At this point, just above the junction of the Cabul, which flows from the west, the Indus has been forded during the dry months; but that is looked upon as an exploit even here; and there is no other point between the gorge of the Hundû Cosh and the Arabian Sea, where even an elephant can pass without swimming.

The Cabul, though small in comparison with the Indus, is still a large river, draining the southern slope of the Hindû Cosh for nearly four hundred miles in longitude, and having one branch that extends nearly three hundred miles beyond the mountains. After the junction of the Cabul, the Indus receives no other large branch for many miles.

As the Indus, and, partially, the Cabul, receive their waters from the north side of the

Hindû Cosh, they are, of course, annually swollen by the melting of the snow upon those mountains, and also by the periodical rains.

It is probable that the valley of the Indus, above Attock, and also part of that of the Cabul, have, at some early period, been a lake, until the action of the water forced a passage through the hills which lie immediately to the south. Even at Attock the rivers are very impetuous when swollen, and their junction occasions a whirlpool which boats cannot approach without certain destruction. The Indian priests have invested the meeting of rivers with peculiar sanctity; but they do not, though it is probable that the early population of this part of the country was wholly Hindû, attach any sanctity to this most formidable junction; neither, indeed, do they honour the Indus as they do many rivers of very inferior magnitude. A few miles below Attock, the hills approach close to the Indus; its channel is narrowed to less than one hundred and fifty yards, and its depth and velocity are both very great. It winds with this violence through the hills for about sixty miles, in a deep channel during the dry season, but full to the banks in the rains, till it comes to the remarkable salt ridge of mountains which extends across the valley, north-west and south-east, for about two

hundred miles, in the average latitude of about 33°. As a passage through these is more easily formed than through the rocks, the course of the river becomes more broad and tranquil, though it is still deep, and the banks in the dry season elevated. The salt ridge terminates at Calabaugh, and thence to the ocean, the Indus flows over plains, generally in more than one channel, often shifting these in the rainy season, and inundating the country.

When it has reached the plain, the principal stream of the Indus, even when reduced by the separation of some smaller ones, is about three thousand feet in breadth, in those seasons when its volume is the least. In the pause which the Indus makes while passing the valley above Attock, and in the great length of its course that lies over a level country, having comparatively a barren surface, and being without much rain, we have sufficient reasons why its waters do not bring down fertile mud to the ocean, in the same manner as the Ganges; and why, notwithstanding the great length of its course, the quantity of its water, and the extent of its floods, nothing deserving the name of a fertile delta has been formed at its confluence with the sea. Some of the islands which are formed between its channels in the lower part of its course are rather fertile, and so are portions of

the plains which it irrigates; but the prevailing character of the country on both sides of the Indus, for the last four hundred miles of its course, is sterility; and the islands which have been formed by it in the ocean are composed chiefly of sand, which produces little, save hard wiry grass, similar to that which grows upon downs of sea-sand in most countries where these occur. The characteristic features of the valley of the Indus, as valuable in a practical point of view, are therefore, to be sought for in the upper valley, above the salt range.

One of the branches of the Indus, though inferior to that river in magnitude, yet perhaps contains more water than any river in Europe, and has its secondary branches so equally spread over a great extent of country, as to have occasioned the name of Punjaub, or "land of rivers," to be given to it. These rivers discharge the rain which falls, and the snow which melts upon the mountains, from the pass by which the Indus enters the plains, to the lake of Rawan's Head, on the confines of Thibet, in lat. 81°, a range of about five hundred miles. The united stream, by which the rivers of the Punjaub mingle with the tide of the Indus, is named the Punjnud, and it is composed of five rivers, which all rise in the mountains, and converge toward the south-west.

As the antients entered India by the ford of Attock, and traversed the plain of the Punjaub, toward the Ganges, those rivers were known and named by them. The first river, proceeding from the Indus eastward, is the Jhylum (the Hydaspes of the Greeks). This river has a course of about seven hundred and fifty miles. It rises in the north-east angle of the Hindû Cosh, just about the point where the chain of mountains begins to get the name of Himalaya, and first flows westward parallel to the mountains, through the beautiful little valley of Cachmere, and is not more than fifty miles from the Indus, at the point where it turns toward the south-west, and approaches the Punjaub. While passing through Cachmere, the Jhylum receives branches both from the north and the south, the vale of Cachmere having a secondary ridge of hills on the south of it, which indeed turn round by the west, approach the Hindû Cosh, and with those mountains surround the valley, except a winding passage through which the river finds its way. The appearance of Cachmere would lead to the supposition that it had been once a lake, which has been drained of its water by the river cutting a passage; and the appearance is corroborated by a local tradition. From Cachmere downwards, the average distance of the Jhylum from the Indus may be rated at about one hundred

miles; and after a course of about five hundred miles from its source, it unites with the Chinaub, the Acesines of the Greeks.

The Chinaub rises on the opposite side of the same summit that gives rise to the Jhylum, and flows south-west, with a tolerably straight course, to its junction with that river. As it comes from the snowy mountains with a straight direction, and an uniform declivity, the floods in it are strong, and its seasonal variations considerable. Like the Indus, the Chinaub receives its chief supply of water in the mountains, it being, to the north of Lahore, that is, about the middle of its course, from the source to the confluence with the Jhylum, nearly a mile and a quarter wide in the rainy season, at which period it runs onward with a velocity of more than five miles an hour. In the dry season its dimensions are small in comparison, the width being less than a quarter of a mile, and the current comparatively slow. There are many forests in the hilly country through which the first part of the course of the Chinaub lies, the produce of which is floated down the river. Although the Jhylum and this river flow for some time very near to each other, and consequently meet at a small angle, the union of these streams is attended with probably more violence than that of the Indus and the Cabul, for it has

attracted the particular notice of those who have recorded the successive invasions of India from the west. Where those rivers unite, the Chinaub may, on account of the comparative straightness of its course, be regarded as fifty miles shorter than the Jhylum, though in the season of the floods, it probably discharges a greater quantity of water.

About thirty miles below the junction of these rivers, and forty above the city of Moultan, their united current is joined by the third river of the Punjaub. That is the Ravey (Hydrastes) of the Greeks, called also Irvati, after Indra's elephant, in the Hindû mythology. The course of the Ravey is not so far to the eastward as that of either of the rivers last mentioned, and its quantity of water, and also the violence of its flood, are less. It does not, like them, rise in the great central chain of mountains, but in a secondary ridge, about sixty miles to the south-west; and, in all probability, though that part of the country has not been carefully explored, separated from them by a valley opening to the south, and containing a branch of the Chinaub. These secondary mountains lie nearly in the direction of the salt range that cross the bed of the Indus; and, though interrupted by the course of the other rivers, are probably a portion of the same.

Unless where it stagnates, the Ravey is nowhere much more than five hundred yards across, and in the dry season it does not exceed forty. United with the other two, however, the conjoined river rolls by the city of Moultan, and toward the Indus, a vast and rapid stream. This stream retains the name of Chinaub, flows very near to the Indus for a considerable distance, and probably unites with it, in the rainy season, in forming one general inundation higher up than Ooch. At Ooch, the Sutledj joins the stream from the east. The Sutledj, however, though the largest, is not the next in order of the five rivers of the Punjaub.

That river is the Beyah: its direct course from the mountains is considerably less than that of the Ravey; but as it contains a greater quantity of water, and also floods more in the rainy season, there is much probability that the whole extent of its course is not known; and that future travellers may find it flowing toward the south between two parallel ridges of the mountains, from at least one hundred miles higher up than it has yet been laid down in the maps. At least the quantity of water that it contains, as well as the distance of other rivers from each other at this part of the Himalaya, would lead to some such conclusion as this. The Ravey

joins the Sutledj about seventy miles to the south-east of Lahore, and nearly three hundred miles from Ooch, where their united streams join the other waters of the Punjaub.

The Sutledj is the last, and probably the largest (certainly the longest) of all the rivers in the Punjaub. It is understood to be the Hydaspes of the Greeks, though it is by no means improbable that the only place of it with which the followers of Alexander were acquainted, was that below the junction with the Beyah, to which the name of Kivah is applied. Even in that part, there are sometimes as many channels as four, the course of the river westward, near the margin of the great western desart, being comparatively flat. Though the whole course of the Sutledj has not been seen, there are many reasons for believing that its remotest source is in Rawan's Head, and some adjoining lakes, which may at some seasons be united; that this branch, with another that meets it, flowing from the north-west, drain a valley nearly three hundred miles in length, beyond the great range of the Himalaya, not far from the source of the Indus; and thus more than fourteen thousand miles from the Arabian Sea. This will give the Sutledj a longer course than the Ganges, and thus, in point of length, make it rank the second of

Indian rivers; but it drains only one succession of valleys; and as the quantity of water is in proportion to the breadth of the country drained, as well as to the length, the volume of water is nothing compared to that which the Ganges receives from its many tributaries. The source of the Sutledj is very elevated, probably not less than fifteen thousand feet above the level of the sea. The pass by which it escapes through the Himalaya has not been so particularly described, as that an opinion can be formed, whether the valley from which its two primary branches come, has, or has not, been a lake; but, from general circumstances, one would be inclined to conclude, that such has been the case. The descent of the Sutledj, after it breaks through the great chain of mountains, and flows toward the south-west, is rapid; but it does not appear that there are any cascades of great elevations. These do not, indeed, appear to be general features of the mountain streams in the north of India. The course of the Sutledj, from the centre of the mountains, to where the Beyah joins it, may be estimated at about five hundred miles, and their joint course to the Indus about four hundred more.

The united stream of the Punjaub rivers, from Ooch downward, is very near to the Indus. The deepest channel, and consequently the only

or the chief one in the dry season, is understood to unite with that of the Indus, about sixty miles farther south than Ooch; but it appears to be different at different times of the year; and it is probable that, from the volume of water in those united floods, and the violence with which, notwithstanding the comparative flatness of the country, it moves, the deep channel may frequently change its direction.

These outlines of the celebrated rivers of this part of India, will save much in the description of the country. The sources of them all are elevated; they flow, for a considerable part (upon the average more than the half) of their courses through hilly countries; and they have no lakes to regulate the flow of their waters; while the lower parts are comparatively flat, and allow those waters partially to stagnate. Hence it follows that, unless where there is a circular valley like that of Cachmere, there can be no great extent of flat land in the hilly countries, and no meadows upon the banks of the rivers till they come to the plain, because the violence of the floods would wash them away.

The converging of so many large rivers as there are in the south-western part of this country, necessarily ensures a high degree of fertility; and, accordingly, the *doabs*, or narrow portions of land, between those rivers near their

junctions, have always, in tranquil and peaceable times, been famous for their agricultural produce. For a considerable period that part of India has been in a very unsettled state; the fields have lain waste; the desart has encroached; and perhaps there is not, at the present time, a portion of the earth's surface that stands more in need of human industry and skill, nor would they repay them more abundantly, than the Punjaub. Nor is there, perhaps, in the world, another place in which the power of water could be rendered so generally valuable, for irrigation, for conveyance, and for every purpose to which an abundance of that liquid can be applied.

From the Sutledj southward, till the desart be passed, there is nothing deserving the name of a river. Upon the western verge of the wide valley of the Ganges, or rather that of the Jumnah, its great western branch in the north, there are the commencements of a few streams, such as the Cagger; but their courses are short; they soon get into that part of the country where the influence of the monsoon is hardly felt, and are lost in the desart. Even that desart is not wholly destitute of moisture. Notwithstanding the great quantity of water which the rivers of the Punjaub discharge into the Indus, and which that river rolls to the sea, a considerable quantity appears to be absorbed by the thirsty

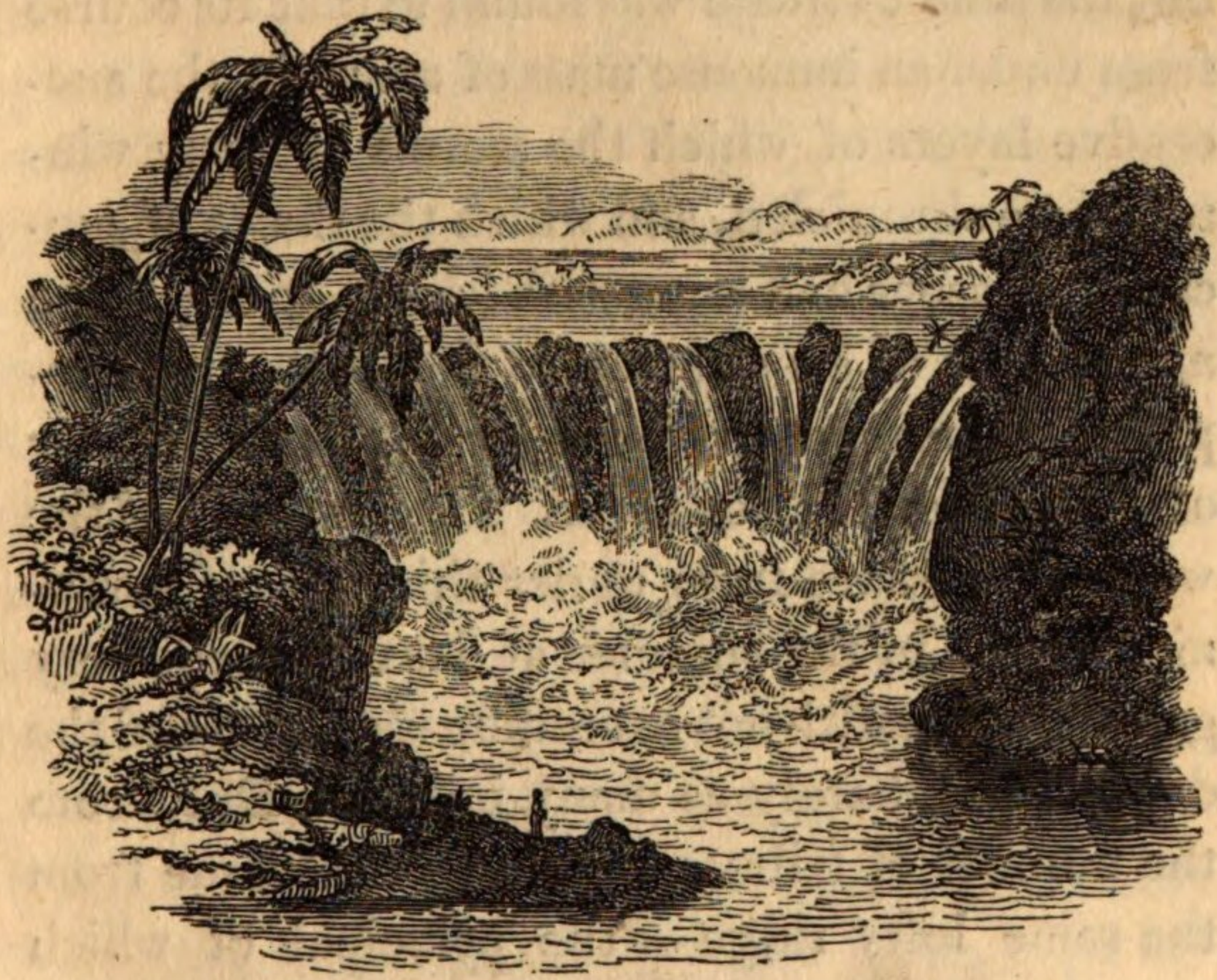
soil; and though it fertilizes the surface only at some small and scattered Oases, where a more retentive soil forces it up, there is evidence that water finds its way through the lower strata upon which the desart rests, all the way from the land of rivers to the sea. The wells must be often dug to a great depth; but there is hardly a place where, if the depth be sufficient, a supply of water cannot be obtained. This is found to be the case throughout the whole extent from the Sutledj to the Gulf of Cutch, and upon it there might be grounded a question as to how far the water might be reclaimed. That is a question upon which we have no leisure for entering, and for the satisfactory solution of which the data are far too deficient, although we had.

Still one cannot avoid noticing that this part of India has, in the lapse of ages, undergone a change much for the worse. The evidence is not altogether clear or continuous; but still it is sufficient to warrant the conclusion that, in consequence of the desolating wars which have been waged by successive invaders and internal spoilers, the artificial irrigation has been neglected; and that, in consequence, the desart has crept onward, till it has not only dried up the water of streams that once were of considerable magnitude and perennial, but that it has

obliterated their channels, by filling them with loose sand, and thus converting what once were the firm and rocky beds of the currents into drains, by which the water is concealed and dissipated. In all warm countries, where the dry seasons are of long continuance, this is the natural progress: taken in time, it may be prevented by industry; but when it has extended so far as in this part of India, the retracing of the progress is probably too much for human art.

CHAPTER IV.

RIVERS.



BIRRA CHUKI.

THE *Ganges* is the next river that claims our attention; and as its general course and also the nature of the land through which it mingles, in divided streams, with the sea, have already been hinted at, the notice of it may be the more brief.

What the Hindûs reckon the true Ganges, though it is not perhaps the most remote branch of the river, or that which rises nearest the summit of the Himalaya, is the Bhagirathi, which has been traced to a point in lat. 31° and long. 79°, elevated nearly fourteen thousand feet above the level of the sea. No fountain has been seen; but the infant stream was found to take its course from under an immense mass of snow, in the successive layers of which the storms of many winters were chronicled, and which the thaws of successive seasons had hung with icicles, giving some appearance of consistency to the fable which represents the sacred river as issuing from the hair of Mahadeva, the destroyer. The quantity of the water that issues from under this mass of perennial snow, in the summer at least, is not very great, the breadth not exceeding nine feet, and the depth being barely as many inches. But, from the number of tributary streams that issue from the same lofty ridge — the principal of which are the Dauli and the Alacananda, and the rapidity with which they descend, the Ganges soon becomes no inconsiderable river. At Hurdwar, Ganga dwara, the gate or passage of the Ganges [the similarity of the word "*dwara*" to the Gaelic *dorras*, and the English *door*, and still more the word *thorough*, all of which have similar meanings, is one of a number of very

striking coincidences],—at this celebrated place of Hindû pilgrimage, the Ganges has already become a river of considerable magnitude, though the distance which it has flowed from the original snow is not, including all the windings, more than one hundred and fifty miles. But the descent is still more remarkable than the quantity of water. The source, it has been stated, has an elevation of about fourteen thousand feet, while that of Hurdwar is little more than one thousand, so that, in the short space of one hundred and eighty miles, the Ganges descends thirteen times as much as in all the remainder of its long passage to the ocean, a distance that cannot be estimated at less than one thousand three hundred miles; so that the average rate of descent, from the very first entrance of the river into the low country, is not much more than nine inches to the mile, —a fact which explains why its current should be so very broad and deep; and have, even in the upper part of the valley, often more the appearance of a lake than of a river. From Hurdwar to the junction with the Jumnah, an extent of certainly not less than five hundred miles, the Ganges receives no very large branch from either side: and yet in this part of its course its width is seldom less than a mile, and often a mile and a half. In the dry season

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however, the quantity of water is not great in proportion to this width of channel; many parts are interrupted by mud and sand, and several are fordable. The addition of water poured in by the Jumnah and its great western branch, the Chumbul, is very considerable; and, from that junction, to where the river divides into a number of channels, at the head of the delta, a distance of not much less than six hundred miles, the depth of the Ganges is seldom less than thirty feet. This is the estimate when the water is at the lowest; for in the rainy season it rises more than thirty feet above its ordinary level, and, with the rise, the velocity of the current is increased. The width is not uniform throughout the whole extent; for there are some places, comparatively far down, where the extent from bank to bank is, in the dry season, considerably less than a mile. At those places the current is very rapid, and where the earth is soft, which is its general character, the banks are constantly falling in at some places, and receive additions at others. The interruptions occasioned by these narrows, and the windings of the river, reduce the general fall, when the water is low, to considerably less than the nine inches per mile, which is the general average from Hurdwar to the sea; and as the greater part of the interruption is caused by the delta, perhaps the current is more rapid there than in

any other part of the river. During the floods it is decidedly so; as the rise, which is thirty or thirty-two feet in the upper part of the river, subsides till it be only a foot or two at the confluence with the sea, and thus an additional slope of about thirty feet, and that entirely of water, is given to the last two hundred or two hundred and fifty miles.

In a mere sketch of the Ganges it would be in vain to attempt enumerating its tributary streams; they are more numerous than those of any other river; and though they do not, just in consequence of their greater number, present, individually, so striking and distinctive characters as the five rivers of the Punjaub, they discharge a much greater quantity of water. The longest branches are on the western side, and have their sources within sixty miles of the Gulfs of Cutch and Cambay, so that they are really longer than the Ganges itself; but, taking the aggregate, the greatest body of water flows from the ridge of the Himalaya on the east. Those mountains retain their giant elevation along the whole line of the valley. Badrinath, between the Bhagirathi and its first branch, the Alacanada, has an elevation of twenty-three thousand feet, while the mountains between that river and the remotest source of the Gogra rise to the height of nearly twenty-six thousand. Dhawalaghiri, about one hun-

dred and sixty miles farther to the south-east, from whose lofty cliffs the first streams of the Gunduck are poured down, has been already mentioned as nearly twenty-seven thousand feet high. The summit from which the Cosa flows, and which is two hundred miles still to the south-east, is twenty-four thousand feet high; and Tchamalari, two hundred miles to the east of the last mentioned, which pours down the Gaddadah, through Bootan, to the Brahmapootra, in the valley of Assam, is twenty-six thousand. This vast ridge, the summits of which are every where so lofty as to intercept the highest clouds, stretches parallel to the Ganges, and Brahmapootra, for a distance of nearly a thousand miles; and the distance where greatest, from Dhawalaghiri, to Allahabad at the confluence with the Jumnah, is not more than two hundred and fifty miles, while from the confluence of the Cosa with the Ganges, farther down, to the summit of the mountains, does not exceed one hundred and fifty. These mountains intercept the current of humid air during the rainy season, and, during the dry heat, they pour down their melted snows, so that the portion of the valley that lies between them and the Ganges is more abundantly supplied with water than any other portion of the earth's surface,—and not water to stagnate upon the surface and taint the air, but water which sweeps onward to

the Ganges, down from a height of at least twenty thousand feet. To this, however, there is one exception, — the Terriani, or jungle, immediately at the bottom of the secondary mountains, which is constantly enveloped in a thick and pestilent fog.

Of the branches that enter the Ganges on the mountain, or left hand side, there are five principal ones, that have their origin in the lofty mountains, and many smaller ones between, that spring from the hills that extend into the Nepolese or mountain half of this side of the valley. Those five branches are the Gogra, the Gunduck, the Cosa, the Teesta, and the Brahmapootra.

The source of the Gogra has been already mentioned as near that of the Alacanada branch of the Ganges. Its course is south-east, over a distance of about five hundred miles, and it contains a great quantity of water in proportion to its length. The first part of it is rapid; but, when it reaches the plain, the current is slower, and it expands in breadth; and, for two hundred and fifty miles, flows through a level country of great fertility. Its confluence with the Ganges is, in direct distance, about one hundred and forty miles farther down than that of the Jumnah; but that part of the Ganges winds so much that the distance by water is more than double.

The Gunduck is a much smaller stream than the Gogra; and it enters the Ganges between thirty and forty miles farther down. Still its course is three hundred miles, and probably more, for it has not been explored. As it rises in the most elevated part of the Himalaya, its descent is rapid; and though it winds a great deal in the plain, it does not extend to the same width as most of the other large rivers. From this river, the secondary mountains assume more the character of a continuous ridge than in the upper part of the valley; and thus give to the country, through which the Gunduck and the Cosa have the upper part of their courses, the character of a second valley, parallel to the great one of the Ganges.

The course of the Cosa is about the same length as that of the Gunduck; the greater part of it among the mountains, and in the secondary valley of Nepâl: and when it descends into the plain, it expands into a wide channel, studded with islands. Its junction with the Ganges is about one hundred and fifty miles below that of the Gunduck.

The Teesta is the last large branch that can be considered as joining the Ganges while a river; for the Brahmapootra only unites with it in what may be considered as an estuary. The upper part of the Teesta has not been explored, or its source found (except by the burin

of the map-engravers, which, in its time, has made many discoveries and revolutions in geography); but it is supposed to rise even beyond the Himalaya. It joins the Pudda (or great eastern branch) of the Ganges, about one hundred miles from the Bay of Bengal, and its course through the Bengal provinces is about two hundred and fifty miles. A little before it enters that province, it is said to descend in an immense cataract, which is not a very common feature of the rivers of that part of India. Indeed the great height and the annual flooding are against the existence of cataracts, as both tend to enable the river to smooth a channel for itself, by tearing away elevations, and filling up hollows. The descent of the Teesta into the plain of Bengal is rapid, however; and, though its current is swift, the breadth, where it enters Bengal, is about half a mile. In the lower part of the country through which it flows, there is an immense number of rivers, and, in the rainy season, it forms junctions with the Brahmapootra and the Ganges. This part of India is, indeed, peculiarly humid; the soil, in consequence, soft, though very fertile; and, thus, the channels of the rivers are very liable to change.

Between the Gunduck and Teesta, there is a river which rises in the Himalaya, and which,

in any other country than this, would be accounted a noble stream. That is the Mahanada. Its path is very winding, and, therefore, cannot be estimated at much less than three hundred miles. It falls into the Ganges, about midway between the Gunduck and the Teesta.

The Brahmapootra is the last great river flowing toward the Ganges, or its immediate estuary, on the left. Of this mighty river, the origin and the course have been the causes of a good deal of hypothesis, which shows the danger of trusting to the authority of names in cases of fact. The Brahmapootra, contrary to the analogy, and the real accounts of Assam, as far as these went, was laid down by some great geographers as a continuation of the Sanpoo of Thibet, which drains the water from the northern slope of the Himalaya; while some minor ones, ploughing a channel for it in the copper with their burin, (as before observed), sent it down to Rangoon, as the river of Ava,—the Irawadi of the Burmans. Now, it has been ascertained, that the rivers of the Burmese territory all have their sources in the Naga mountains, which are a continuation of the Garrows, and most likely a spur of the Himalaya, doubling round the sources of the Brahmapootra; that not one of those rivers has probably so much as a rill beyond the latitude of

28°; and that there is no great river that passes from the northward over to the southward of the Naga chain, from their commencement in the Garrows opposite Bengal, to the confines of China. The Brahmapootra has also been followed till all the branches of it have become mere mountain torrents; and, instead of coming from the other side of the Himalaya, those mountains were seen raising their summits so far to the north, that the torrents could not have come from beyond them. The geographical question is, therefore, narrowed to "What is the termination of the Sanpoo of Thibet?" and till the fact shall be ascertained, the most rational hypothesis is, that it is the Yang tsi Kiang, or Blue river, that falls into the sea below Nankin, in China,—a river to which the Chinese authorities assign a very long course before it enters China proper.

The termination of the Brahmapootra threatens to be, some day or other, a much more serious matter than the geographical mistake about its origin. The doab between it and the Ganges is soft alluvial soil; and in 1809, the Brahmapootra showed that a very little more flood would have swept thirty thousand square miles of rich land into the sea. That may one day be the case, and Cossimba-

zar, which is now two hundred miles from the sea, may be the port of the Ganges.

We have been thus particular in the enumeration of those rivers, and in pointing out the elevations from which they descend, because in these circumstances are to be found the explanations of many of the peculiarities of this most interesting portion of the world. The circumstances are such as to produce the very maximum of atmospheric influence by which the earth is renewed and fertilized; and also, in the accumulated floods, a power by which, were it not that the north-eastward motion of the monsoon checks it, that earth might be washed away. Even the Hindûs, rude as they must have been at the time when their mythology was formed, appear to have had some notion of a power of this kind in the rivers. The greater part of those that have been mentioned have divine attributes imputed to them; and they are all coupled with allusions to Sina, the destroyer.

We shall now turn our attention to the branches that join the Ganges on the right or western bank. On that side, the branches, at least the large ones, are few compared with those on the left. The ones most worthy of notice, in a general sketch, are the Jumnah and

the Sone, though the former has some very extended ramifications.

The Jumnah has been traced to a great chasm in the south-west side of the great snowy mountain of Jumnoutri, which has an elevation of twenty-five thousand feet, and on the south-east side of which the Ganges has its origin. The place is described by Captain Hodgson, who visited it in April, 1817, as peculiarly striking. A vast mass of snow had descended from the mountain, and filled the chasm between the precipices of granite to the depth of forty feet, the width of the chasm being one hundred and eighty. This mass of snow had been hardened to the consistency of ice by the action of the frost; but it was perforated from below by the action of several boiling springs. Through one of these openings the adventurous officer descended; and having fired some white lights, these enabled him to discover a most singular origin for a river. Over a considerable extent of the granite rock, springs of hot water bubbled up through the fissures, some of them warm enough for boiling rice, and all of them depositing as much oxide of iron as to render it extremely probable that the heat is occasioned by the decomposition of pyrites. In those springs the water rises up with much violence and ebullition, and sends up a great quantity of steam;

but the nascent river is very trifling, being only three feet wide and a few inches in depth. Like the Ganges, the Jumnah is not the head that furnishes the greatest quantity of water: it is much inferior to the Tonse, and also to the Giree, streams which rise farther to the west, and join it near its source among the mountains. The Jumnah receives the greater part of its waters among the mountains; and though its course is not very long before it enters the low country at the village of Fyzabad, in the province of Delhi, it is there two-thirds of a mile wide, and deep and rapid during the rains, while, in the dry season, it has a width of three hundred feet. The want of branches in the upper part of its course through the plains is a remarkable feature of the Jumnah. For the first five hundred miles from its source, there is only one branch worth mentioning on the east, and there is not one on the west. The summit level of northern Hindûstan is, indeed, near the west bank of the Jumnah, and the few streams that rise in that quarter have their sources not far from the river, and they run toward the south-west and are lost in the desart; so that, during the dry season, there is most water in the Jumnah in the upper part of the province of Delhi. The adjoining land is, in consequence, dry; but the course of the river

is flat, and its waters may be applied to the irrigating of the fields.

The principal branches of the Jumnah are the Chumbul, the Sind, the Betwah, and the Cane. These drain the waters of a very large portion of country—of all that part of Hindûstan Proper, which is not included in the districts watered by the Indus and its branches, or by the Ganges and its tributaries. If lines be supposed drawn from the Gulf of Cambay, one to Delhi, and the other to the confluence of the Jumnah with the Ganges at Allahabad, these, with the Jumnah, will inclose a three-sided space, about equal to, and nearly corresponding with, that drained by the rivers that have been mentioned.

The Chumbul is by much the largest of these rivers. Its source (as indeed are those of all the great branches of the Jumnah) is in the first or great western spur of the Vindhaya mountains, which separate continental from peninsular India, and are, under different local names, ramified over the latter. The elevation of those mountains is trifling compared with that of the chain that divides India from the rest of Asia. In the ridge from which the branches of the Jumnah issue, there are not many parts that have a greater elevation than two thousand feet, and there are very few indeed that have so much as

four thousand. Those rivers are, in general, tame and tranquil, and produce little effect upon the soil compared with those that come thundering down from the Himalaya into the valley of the Ganges. But still they are fine rivers; and the mountains, though not lofty, are picturesque, being chiefly composed of trap, and presenting the perpendicular cliffs, and detached angular and columnar mass, for which that species of rock is so very remarkable.

The Chumbul rises in those mountains a very little to the north of the Nerbudda, and about one hundred and fifty miles higher than the confluence of that river with the Gulf of Cambay. The valley, or, rather, the plain, of which the streams are collected into the Chumbul, is of considerable dimensions, the width from the source of the remotest eastern to that of the most western branch being about three hundred miles. The length of the Chumbul, the course of which is a curve, having its convexity to the north-west, is about five hundred miles; and the surface that it drains is not much less than eighty thousand square miles. The upper part of the Chumbul, among the hills, is often without water in the dry season; the middle is full of rocks and shallows, and unfit for the purposes of navigation; but the lower part, toward

the Jumnah is, for a considerable extent, a very fine river.

The Sind has its source in the same ridge as the Chumbul, but considerably farther to the east; and as the high country there approaches nearer to the Jumnah, its general course is more rapid. Its length is about two hundred miles; but it is of little value for inland navigation. In the dry season it is shallow and much interrupted; and, though, during the rains, it contains a great quantity of water, it is impetuous, and, in many places, dangerous. The confluence of the Sind with the Jumnah is near that of the Chumbul, and in the doab between them there is a number of minor streams.

The Betwah resembles the Sind in many of its characters, though it is a much larger river. Its source is within forty miles of the Nerbudda; and it flows to the north-east, and at last nearly due east, the whole length being nearly three hundred and fifty miles. The greater part of the country through which it flows is hilly; and in some places there are rapids. In the drought, the quantity of water is small, compared with the length of the river; and even when swollen by the rains, it is not navigable. Its confluence with the Jumnah is about seventy miles farther down than that of the Sind.

The Cane is still farther to the east, and,

like the last two rivers, flows chiefly through a hilly country, being, like them, useless for the purposes of navigation. It rises within a very few miles of the Nerbudda; and its general direction is nearly north, though from the hilly character of the country through which it flows, it is very winding. Its length is more than two hundred miles. The point where the principal stream rises is nearly midway between the eastern and western seas.

From the sources and directions of those western and southern branches of the Jumnah, it will be seen that the country north of the Nerbudda, and eastward of the small rivers that fall into the head of the Gulf of Cambay, has a general slope toward the north-east and north. The rise from the Nerbudda is rapid, the watershed which turns the rains and springs the other way being everywhere near the bank of that river. The general slope northward is more gradual; and the country continues hilly for a considerable extent. After the Cane, and some smaller branches of the Jumnah are passed, and that river has united with the Ganges at Allahabad, the range of mountains runs parallel to that river, and not more than fifty miles distant from it, all the way to the confluence of the Sone, about twenty-five miles below that of the Gogra, from the opposite side.

The country where the Sone rises is but imperfectly known; but it is generally understood to be a table land, extending about three hundred miles from east to west, and from one hundred and fifty to one hundred across. Its general elevation is not accurately known; but it is supposed to be about one thousand eight hundred or two thousand feet; to be covered with jungles of forest, interspersed with stony patches, and peaks of trap, rising to a considerable height, though seldom deserving the appellation of mountains. It is a sort of plateau, which connects the range that separates the sources of the rivers that have just been traced from the Nerbudda, with the elevations farther to the south; and rivers flow from it in all directions: the Sone to the north-east; a number of small rivers east to the Hoogly and bay of Bengal; the Mahanuddy to the south-east; some of the branches of the Godavery to the south, and the Nerbudda to the west. The name usually given to this table land is Omerkuntuc. While the Sone continues in the mountains, its current is rapid and interrupted, and its bed rocky; but in the lower part, it is wide and suited for navigation. The name Sone means golden, but that does not apply to anything metalliferous connected with the river, only to the great banks of sand which

it leaves dry in the spring heats. During the rains, as the upper part is rapid and the under slow, a great quantity of water is, of course, accumulated in the latter; and the extent of flood and depositation of sand are proportionate. These, when the flood subsides, give a very dreary and desolate appearance to the margin of the river, whose shrunken current then flows amid a vast arid waste of sandy downs. Nor is that the only evil that results from the quantity of sand that is brought down by those rivers; for the quantity thrown into the Ganges is sometimes so great, that the navigation of that river between Allahabad, at the confluence of the Jumnah, and Bahar, a little below that of the Sone, is interrupted in the dry season,—there not being above eighteen inches or two feet water over the banks. But these interruptions are not permanent, as the Ganges sweeps them away in the early part of the next rains.

Lower than the Sone there are some minor branches that fall into the Ganges, and also into the western or Hoogly channel, after the waters of the river are separated by the commencement of the delta; but these do not form general features of the country, though they add greatly to the fertility of the region through which they pass.

If the rivers that have been noticed are carefully examined upon the map, they will render

the allocation of the provinces and towns, and the knowledge of the surface, in continental India, or Hindûstan proper, a very easy matter; and before proceeding to trace the waters in the south, it only remains to notice the comparatively small streams that flow westward, and empty themselves into the Gulfs of Cutch and Cambay.

The rivers that flow toward the Gulf of Cutch are, in a great measure, only seasonal,—being dry, or nearly so, except during the rainy monsoon. The largest is the Banass (called in some maps the Loaney), which rises somewhere near the city of Ajmeer, but the precise place is not known; and in the country borders on the desart, and partakes a little of that character; probably the highest point at which water is found in the channel, or where the channel differs from the arid and burnt up district through which it passes, may also vary with the season. During the rains, the rivers in this part of the country cover a great part of the surface with a sheet of water, while in the dry season they are themselves drank up by the thirsty soil, or evaporated by the heat, before they reach the Rinn, which may be considered as their general termination.

The rivers that flow southward to the Gulf of Cambay are of trifling magnitude; and would

hardly merit notice, were it not that they mark a small portion of country which slopes toward that gulf. The chief ones are the Mhye, which, after a very winding course of about two hundred miles, falls into the head of the gulf; and the Sambermatty, which passes the city of Ahmedabad, and falls into the gulf to the west of Cambay.

The Gujerat being nearly insulated from the rest of the country, being hilly, and sloping toward all sides, has small rivers flowing in all directions; but none of them is so much superior to the others as to give any general character to the country.

From what has been stated, it will be perceived, that if a diagonal be drawn across Hindûstan proper, from the Gulf of Cutch to the sources of the Jumnah, the general slope of the one division is south-westward toward the Indus, and that of the other south-eastward toward the Ganges, till the southern portion be arrived at, and that slopes from the Vindhaya ridge northward, to the Chumbul, the Jumnah, and the Ganges in succession. The northern portion of the western division is well watered, while the southern is dry and desart. The whole of the eastern abounds in rivers as far west as the Jumnah; but beyond that, it is deficient in humidity till the Chumbul be arrived

at; and the elevated country, where the southern branches of that river have their origin, is also subject to be parched during the dry season.

It now only remains to notice the rivers in the peninsular part of India, or that which lies to the south of the Vindhaya ridge and the plateau, or table land, in which that ridge terminates eastward. This portion was by the Hindû geographers called the Deccan, or south; but as the Mahomedan conquests did not for a long time extend to the southern table land, or beyond the river Krishna, the Deccan was by them considered as applicable only to the countries between the Nerbudda and the Krishna; and as the foundation of the modern geographies of the country is the Ayeen Acbaree, or Institutes of Acbar, a geographical or statistical account of the country, drawn up by Abul Fazel, perhaps the most learned Mahomedan minister of India, as Acbar certainly was the most illustrious Mahomedan sovereign, this distinction is retained; and the Deccan, which literally means the south, is applied to the centre, to the portion extending from about the fifteenth to rather beyond the twenty-second degree of North latitude, or occupying the peninsula, from sea to sea, for five hundred miles of its length. A very considerable portion of this division, extending from the northern pla-

teau in a south-west direction, to the banks of the river Godavery, is but imperfectly known; but from the accounts that are given of it, it seems to be rather elevated, very much overrun with wood, and interspersed with detached rocky hills. In a small portion of the north of the Deccan, the slope is toward the west; but the general inclination of the country is toward the bay of Bengal.

In that portion which slopes to the west, there are two rivers, the Nerbudda and the Tuptee, which both fall into the Gulf of Cambay, and are nowhere at any great distance from each other.

The Nerbudda is understood (for the fact has not been ascertained by Europeans) to have its remotest source in a seasonal pool, or morass, upon the table land of Omerkuntuc, where the height above the level of the sea is about two thousand five hundred feet, and where the Sone also has its source; but at one season, the morass and upper part of the river are said to be dry. The general course of the Nerbudda is nearly upon a straight line; but its descent is rapid, and very much interrupted by rocks or banks, so that the navigation is of little value except for about one hundred miles toward the Gulf of Cambay. At this place it may be considered rather as an estuary than a river, as it has a

breadth of nearly three miles. At the head of this one hundred miles of estuary navigation, there begins a wild and hilly tract, which extends for nearly an equal length, and in this the channel is so interrupted that it cannot be navigated. In the course of its passage through this tract, it has a descent of more than six hundred feet, or six feet in the mile, and as that is made by a succession of pools and rapids, the obstacles to sailing are insurmountable. Above this rapid it reaches to the breadth of one half or three quarters of a mile; but in almost all parts of its course there are interruptions. From the proximity of its sources to those of the Sone, which flows to the Ganges, and of the Mahanuddy, which flows to the bay of Bengal, there is no river in India upon which it would be so desirable to establish a navigation; but the difficulties would be great, probably insurmountable. The whole length of the Nerbudda, is estimated at about seven hundred miles; but though it rises much during floods, the average quantity of water that it discharges, is rather small in proportion to its length, because it runs in a narrow valley, and has no branch of any considerable magnitude. The south side of that valley is formed by the Sanpoora, or Calygong ridge of hills, which, proceeding westward from the table land, on

the south side of the source of the Nerbudda, stretches westward nearly to the gulf of Cambay, dividing the valley of the Nerbudda from that of the Tuptee.

Though the Tuptee be a much smaller river than the Nerbudda, it is much more valuable; and Surat, the emporium of its trade, has been a place of great resort from very remote antiquity. The whole course of the Tuptee, the general direction of which is winding, and the current not nearly so rapid, or so much interrupted as that of the Nerbudda, is, at least, four hundred and fifty miles. A little to the south of the Tuptee, the summit level approaches the west side of the country, and continues so in the southern Ghauts, the whole way to Cape Comorin; so that for two thirds of its length, there falls no river into the sea, on the west side of India, of sufficient importance to form a general feature of the country. We must, therefore, return to the north-east, and examine the great basin of the Deccan, which slopes toward the bay of Bengal.

There is one river, of considerable magnitude, which cannot be considered as strictly coming within the limits of that basin, but rather as draining the south-east of the table land of Omerkuntuc, and that is the Mahanuddy, which rises not far from the sources of the Ner-

budda, and the Sone, and has a winding course of about five hundred miles. Like all the rivers that have their origin in the same place, the Mahanuddy is very rapid in the upper part of its course; and, like the Sone, its bed and banks are, in the lower part, rendered unsightly and sterile, by vast accumulations of sand. This is in a great measure a seasonal river. During the rains it is nearly a mile in breadth at the distance of one hundred miles higher up than Cuttack, and at that season the principal stream and some of the main branches may be ascended or descended by large boats: but at other seasons, the greater part of the bed is dry, and even at Cuttack the stream is so shallow that it may be forded. Respecting the course of the Mahanuddy, the position of its branches, and the general nature of the country in which it originates, and through which the upper part of it lies, the authorities are a little imperfect and contradictory; but it seems to be a wild and unhealthy jungle. But there are indications of considerable mineral riches in some parts of the district, though their particular locality has not yet been explored by Europeans, and appears to be of very difficult access. But this southern part of the Omerkuntuc must be different in its formation from the north, of which the débris is washed down by the Sone.

Agates, in great numbers and of great beauty, are found among the gravel of that river, while diamonds of the finest quality are met with in the sands of the Mahanuddy; and they are most frequently found in the southern branches. Below Cuttack, the sand brought down by the Mahanuddy has formed a sort of delta, on the southmost stream of which, in a very dreary region, the celebrated Hindû temple of Juggernauth is situated.

The next river south of the Mahanuddy is the Godavery, the largest river in the Deccan. The source of that which the Hindûs designate and worship as the true Godavery, is in the Western Ghauts, not more than seventy miles north-east of Bombay, and the sources of some of the branches further south are even nearer to the sea; so that the length of the valley of this river extends nearly across the peninsula. The river winds a great deal, so that the length of its course is not much less than nine hundred miles; and as it receives large tributaries both from the north and the south, it discharges more water than any other Indian river, with the exception of the Ganges and Indus. The general direction of the valley of this river is from north-west to south-east. The boundary of the valley toward the north is in the Satpoora ridge of hills, which form the southern

boundary of the valley of the Tuptee, and, extending in an easterly direction along the whole course of that river, bend to the north round its source, and again stretch eastward to the plateau of Omerkuntuc. Toward the source of the Godavery, the valley is narrow, as a ridge of hills stretch eastward from the Ghauts, immediately opposite Bombay, and separate the branches of the Godavery from those of the Krishna. At the distance of about fifty miles from the sea, the Godavery divides into two channels, the northmost of which flows into Coringa bay, already mentioned, and both can be entered by small craft in the rainy season; but during the drought, the sandy channel of the Godavery, which is more than a mile wide, contains only a few scattered streams, the deepest of which does not exceed eighteen inches. But when the rains come, it is majestic, and rolls on in a deep volume of water, at least a mile and a half wide. About one hundred miles from its mouth, and just where it enters the district of the Circars, there is a magnificent scene, the pass of the Papkûndu Hills. Above, the stream is a mile and a half in width; but the hills, rising in precipices to the altitude of two thousand feet, close in upon it till the passage is narrowed to one half of its usual width; and when the stream is much swollen, it appears,

when approached from below, to issue at once from a vast fountain in the rocks. From what has been said respecting the lower part of its channel, it is obvious that the Godavery cannot be navigated in the dry season; but for four months during the rains, it is available for that purpose, to the distance of four hundred miles from its union with the sea; and some of its branches serve for floating down the timber, and other produce of the hilly districts in which they have their sources.

The largest of those branches is the Wyne Gunga, which flows from an elevated source in the northern hills, not far from the sources of the Nerbudda: and, after a course of about three hundred miles, falls into the Godavery about two hundred and fifty miles from its confluence with the sea. This river has many considerable ramifications, which, though shallow, and nearly dry in the warm season, are flooded, and adapted to the floating down of timber during the rains. The great southern branch of the Godavery is the Manjera, which, after a very serpentine course, and one remarkable bend by which it changes nearly to the opposite direction, flows into the Godavery about equally distant from the eastern and the western seas. All the branches of the Godavery rise, and, for great part of their courses, pass through

hilly countries, which, in general, abound in timber.

The next river southward in the Deccan, and the one which forms its boundary on the south, is the Krishna. It is the most rapid and turbulent of all the rivers in this part of India. It is of very little avail for the purposes of navigation, though its length be seven hundred miles, and its ramifications have an extent in latitude of not less than four hundred miles. The source of the principal stream is not more than forty miles from the Arabian sea, and that of the Beemah, the first great branch on the north, is within five and twenty. All the rivers, indeed, that rise to the eastward of the Western Ghauts, from 13° to 19° latitude, and the summits are there very near to the sea, fall into the Krishna. The general course of the main stream is eastward; but it is remarkably winding. In general it is high; and about the seventy-ninth degree of longitude it is crossed by the Nalla Malla Hills, where a scene, more singular than the pass by which the Godavery enters the Circars, is produced. Those hills, which, in the more lofty summits, have an elevation of from two thousand to three thousand five hundred feet, occupy a base of about fifty miles; and where the Krishna forces its way through, the projections on the one side correspond so

well to the recesses on the other, and the faces are so bold, and the angles so well defined, that the passage seems as if it had been formed by the rending of the mountains asunder. Those cliffs are in some places nearly one thousand feet in perpendicular altitude; and between them, the current is so violent when the river is swollen, and so much interrupted by shallows and rocks when it is low, that navigation up or down is impossible. The crossing of the river is, indeed, rather a formidable matter to those that are not acquainted with it. In the hilly country the ferry-boats are baskets, of a round or oval shape, formed of bamboo, and covered with hides; and as they are paddled across the boiling stream, they bend, and crack, and admit water, so that they seem to be going to pieces. Primitive as they are, however, they are far better adapted to the river than European boats. They are buoyant and tough, and they move in all directions with equal facility, and thus yield to the violence of the current.

The number of streams that flow from the eastern side of the Ghauts into the Krishna, render it a river of very considerable magnitude even in the early part of its course; and as the rocks by which it is interrupted are occasional, and not continuous, there are some places where,

during the floods, it has a very considerable breadth, and encircles a number of islands.

The first branch of any magnitude that falls into the Krishna is the Gutpurba, which rises in the Ghauts, very near the western sea, in lat. 16°. It flows for some time along the elevated part of the mountains, which there forms a sort of narrow table land: and from that it descends to the interior valley, in a cascade, which is very grand during the rains. A little lower down, the Malpurba descends from the same mountains, and falls into the Krishna, after a course of about one hundred and fifty miles.

The next branch of the Krishna is the Beemah, which flows from the north-west, and has a longer course than the Krishna itself, the extent, including the windings, being upwards of four hundred miles. *Bhima-vima*, in the native language, means terrific, and the appellation is not undescriptive of the stream, which foams through a hilly country for the greater part of its course, though, in the dry season, its quantity of water is by no means great.

The only other branch of the Krishna that it will be necessary to notice is the Toombudra. That river also rises in the Western Ghauts, the eastern slope of which is drained by its

branches for about one hundred and fifty miles, from lat. 13° northward. At that parallel, the Bababooden Hills, which form the summit level of Southern India branch eastward from the Ghauts, and extend nearly to the middle of the country, before they turn northward toward the Krishna, and ultimately join the Nalla Malla ridge, the passage of the Krishna through the Ghaut of which has been mentioned. This summit level, with the Ghauts on the west, and the Krishna on the north, enclose a space of hilly country about two hundred miles from north to south, and half that extent from east to west, and sloping toward the north-east. The Toombudra and its branches wash this district; and they very much resemble the Krishna in their courses and the nature of the country through which they pass. They are, in general, too rapid and interrupted for being navigable, and their channels are too deep for making them available in irrigating the land during the dry season. The chief branch of the Toombudra is the Vadavati, which flows farther to the east, chiefly along the elevated and dreary part of the table land, and joins the Toombudra, about one hundred miles above its junction with the Krishna. The course of the united rivers is east, and they pour their

streams into the Krishna in latitude 16°, and longitude about 78° 20′, where their volume of water is not much less than that of that river.

In no part of India are the rivers of so little avail for useful purposes as among the hilly districts where the Krishna and its branches are situated. They are usually found in dells, that are very narrow, and the steep sides of the intervening hills pour the rains into the rivers as fast as they descend.

The only remaining rivers, of which a knowledge is necessary, in order to fix the positions, and understand the surface of India, are those which the southern table land sends toward the east coast. The largest of these are the Pennar and the Cavery; the latter drains the hilly country to the south of the sources of the Toombudra, and the former the portion of the same that lies on the east of the Vadavati branch of that river.

The Pennar rises about the middle of the table land of Balaghaut, and flows, for the first one hundred miles of its course, northward, through a narrow valley between two other ridges of hills with which the table land is marked. At the point where the Pennar bends to the eastward, it is not above twenty miles distant from the Vadavati; but though it receives the greater portion of its waters in this

upper part of its course, its channel is rugged and interrupted, and it is very shallow in the dry season. When the river turns toward the east, and flows through the Cuddapah district, the valley through which it flows is better than that higher up; but it is much impregnated by salts of soda, which render the water brackish during the dry season. About sixty miles from the sea, the Pennar crosses from a Ghaut in the hills into the low country, which it is employed to irrigate; and its final termination is a little below the town of Nellore. The whole course of the Pennar is about three hundred and fifty miles.

Between the Pennar and the Cavery, the plain of the Carnatic is crossed by other two rivers, which may be mentioned on account of their value for agricultural purposes. These are the Palaur and the Punnair. They both rise in the eastern part of the table land, near the sources of the Pennar and the Cavery. The Palaur has rather a winding course, and considerable breadth of channel when flooded. It passes the city of Arcot, and falls into the sea at Sadras, to the south of Madras, after a course of more than two hundred miles. The Punnair rises not far from the sources of the former; and, like it, is chiefly valuable for agricultural purposes. Its course is about two

hundred miles, and it falls into the sea a little to the south of Pondicherry.

Thence, to Cape Comorin, there are many streams that originate in the mountains, and cross the low country to the sea; but they are generally of small magnitude.

The Cavery is a much larger river than any of these, and though not any where navigable by large vessels it is very useful in fertilizing the country. All the principal streams in the south-western part of the table land, which is here a plain about one thousand five hundred feet in average height above the sea, but surrounded, and partially interspersed, by ridges of hills, fall into the Cavery, so that it descends into the plain of the Carnatic, a river of considerable magnitude. When it reaches the low country it divides into many branches, on which account, though the navigation is rendered of comparatively trifling nature, the benefit to the country in the irrigation of the fields is greatly augmented. Even before it descends from the high country, the Cavery sometimes separates into several channels; and at one of these places there is an island, Sivana Samudra, about nine miles long and one mile broad, with a cataract upon each branch of the river, both of which are very magnificent during the floods.

There is not, perhaps, in the world, a spot combining more of the wild beauties of nature than Sivana Samudra and its vicinity; and one need not wonder that the Hindûs chose this spot for the foundation of the ancient city of Ganga Para, or that they chiselled the rocks into temples.

The place is still sublime in the midst of its desolation. The branches of the river are, when swollen, not much less than one thousand feet wide; the surrounding scenery is wild with cliffs, and wanton in vegetation. Great part of the island is a grass jungle, over which, however, a number of banyan trees stretch their arms, and strike down their successive roots; while the pillars of the antient bridge, standing by hundreds in a row, are the monuments of a glory that is now gone. But the grand spectacles are the falls, which, in height and quantity of water, are not excelled in many places, and in wildness of form, are perhaps equalled in none. The fall on the north side is called Birra Chuki, and that on the south, Gangana Chuki.

The average height of the rock from which the Birra Chuki issues is about one hundred feet; though the sides and pinnacles between the portions of the fall, which are in some places black and bare, and in others glowing with all the splendour of Oriental vegetation, rise consider-

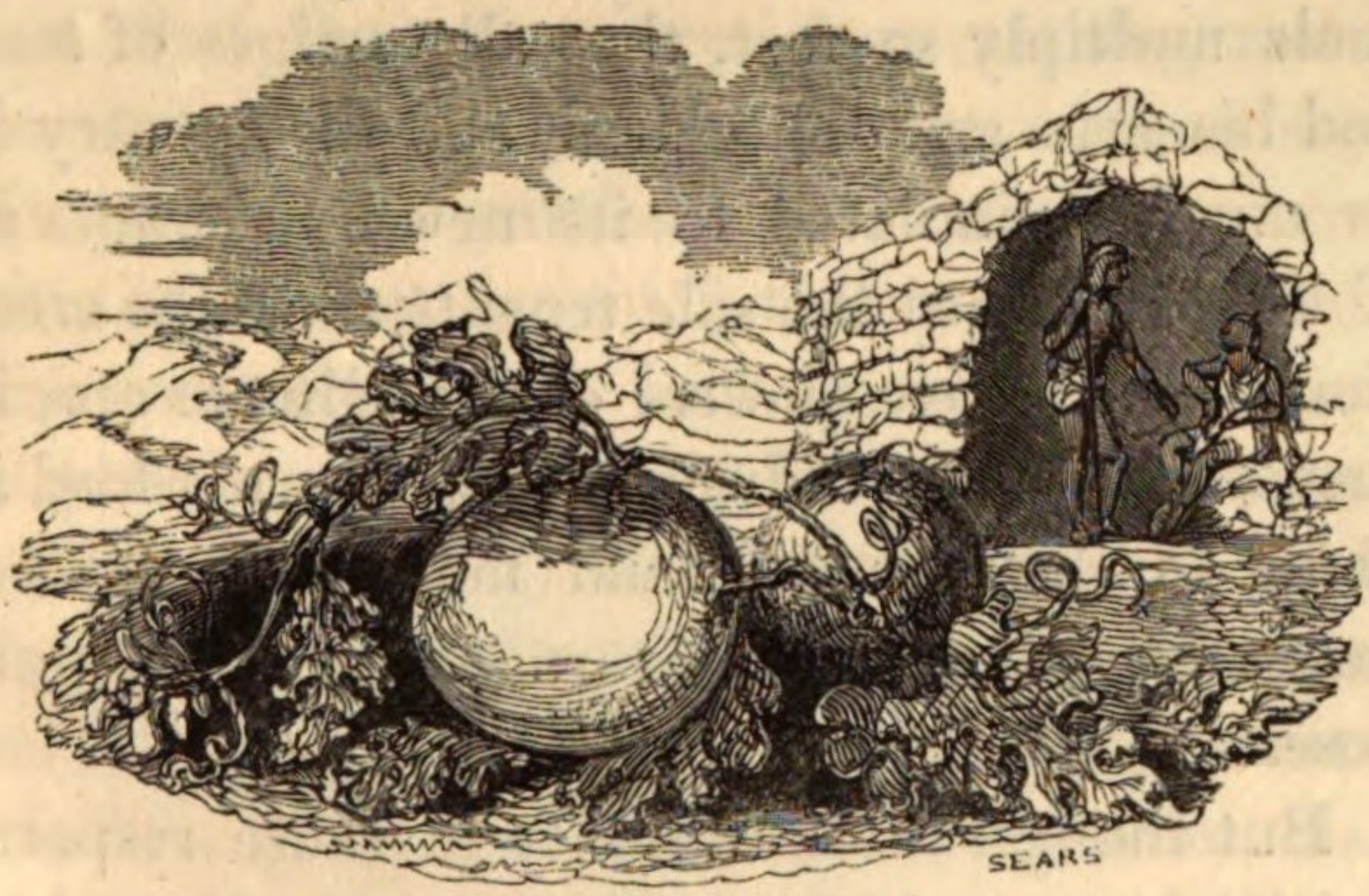
ably higher. This rock forms a curve, nearly a quadrant of a circle, from the centre of which circle the fall is viewed. Over this space ten cascades are distributed, all nearly of the same height; but, as the rocks which separate them give to each a different turn, they dash their sparkling parabolas in sublime confusion into the cauldron below, and have more the appearance of magic than of any thing usually to be met with even in sublime scenery.

Gangana Chuki is even wilder than this, as, though there are not so many cascades, they are more varied, both in quantity of water and in height. This portion of the river is divided into two, a little above the fall. The one nearest the island, which is by far the largest, has worn its channel deeper than the other, and plunges at once into the chasm below, in one cascade, about one hundred and thirty feet high; but there are three or four small portions of it which are separated by masses of rock, through which they are seen leaping from ledge to ledge, till they at last reach the stream about sixty yards from the base of the great fall. The second branch flows for nearly the same distance along a higher part of the rock, where, at right angles to the great fall, it dashes, in two columns, into the middle of the river from an elevation of at least two hundred feet.

Those wild cataracts, in a lonely situation, with a ruined city, and amid the most rich and varied vegetation, present a scene which is striking at all times, and tremendous when the river is swollen and the sky in thunder.

CHAPTER V.

PROVINCES.



SCENE IN THE DESERT.

THE territorial divisions of India are a most perplexing subject. We have seen, that in the soft alluvial parts, near the mouths of the great rivers, the natural features are not permanent, but that land and water change places, to a

greater or a less extent, with the floods of almost every year. The appearance of the surface is not much more stable, if the cultivator suspend his operations. Where it is dry, and fertility preserved by irrigation or by watering, the suspending of those operations for a few years, turns the soil into sand, and the country into a desert; and where there is humidity, the progress of vegetation is so rapid that, in brief space, the whole is converted into jungle, by which the ruins of fields and villages are alike concealed; and, in less than an age, wild animals multiply so fast, that all vestiges of man and his arts are obliterated, and the country is as much assimilated to its new inhabitants as if they had been the sole tenants since the creation. The active powers of the climate are, in fact, excessive; the drought and the rain lord it alone in their turns; and man must labour incessantly, in order to turn them to his purposes.

But though the mutability in those respects has been great, it is nothing to what has taken place in the territorial divisions; and, at least in so far as the native powers are concerned, if one were to mark the exact distributions for any time, they would in all probability be out of date before they could be published.

This calls for a sort of double division of

India, one for geographical purposes, and the other for statistic and political. Europeans were a long time visiting the shores of the country before they acquired any territorial dominion beyond their own factories; and as they were for a long time accustomed to the enumeration of provinces made by Abul Fazel in 1582, that enumeration is still the best for enabling one easily to understand the localities. While, however, it is convenient to use this enumeration, as a sort of dead language, in Indian geography, it is necessary to bear in mind, that those provinces were nothing more than certain portions of the empire, without any reference to the parties who hold the government, or the way in which that is administered. It is also necessary to bear in mind, that since the power of the British became so predominant in India, they have pushed their knowledge and their influence farther than the Mahomedan empire, even in the zenith of its power: and that, therefore, before the territorial distribution can be extended to the natural limits of India, as marked by the great features of the globe, some additions must be made to the antient enumeration. The subject will also be rendered more perspicuous, if we notice separately the distributions in each of the great divisions of the countries on the Indus and its

branches, from the Hindû Cosh to the central desert ;—Hindûstan proper, from the Himalaya to the plateau of Omerkuntuc, and the Vindhaya ridge, on the north bank of the Nerbudda—including those countries on the north-western slope of the Himalaya, and to the east and south of the Delta of the Ganges, over which British influence now extends;—the Deccan, from the boundary of India proper, to the river Krishna;—and southern India, from the Krishna to Cape Comorin. The islands, and the settlements and factories on other and detached parts of the coasts of Asia, which may be necessary to exhibit a complete view of British relations and influence in that part of the world, can be more advantageously noticed apart from continental India.

COUNTRIES ON THE INDUS.

CAFFRISTAN.—That name, which signifies the country of infidels, is, by the inhabitants of the first plain south of the Hindû Cosh, given to the fastnesses of those mountains, which are inhabited by a primitive people, whom those Mahomedan inhabitants in all probability expelled from the plains. Their manners are peculiar; and their religion resembles that of the Bhudists, which prevails to the north and north-east of India, and also that of the Jains,

or Hindû infidels, who do not believe in the sacred origin or authority of the Vedas, and esteem the gods of their own mythology only as mortal men, of superior abilities or attainments. The country of these people is confined to the vallies, which are situated between the lofty and snowy summits of the Hindû Cosh. But, considering their great elevation, those valleys are fertile ; and they are very healthy. On the slopes of these mountains the vine is native, and the people also pay a great deal of attention to its culture. These valleys also afford abundance of pasture ; and some wheat and millet ; but these are said to be of inferior quality. The hatred which these people have to their Mahomedan neighbours is implacable, and each man ranks in honour in proportion to the number he has killed ; but among themselves, they seem to be a simple pastoral race ; and thus this hatred of their neighbours is a corroboration of the supposition that their neighbours have, in the early history of the country, driven them from the plains. They cannot be considered as within India, but rather upon the natural frontier ; as the boundary of their country is every where that line of mountain danger beyond which the people of the plain do not feel safe in following them. But some slight notice of that country is necessary, because,

though the passage is an arduous one, India has been invaded in that way, and *may* be so again.

AFGHANISTAN.—That is the general name of the country to the south of the Hindû Cosh, and the west of the Indus. Its boundaries to the west and the south, are rather indefinite. It was once the seat of a powerful kingdom, which extended its arms over great part of India proper; and it is still of importance for its natural riches, and the activity of its people, as well as being the key of India on the west, by which it has been successively invaded, probably since the days of Sesostris. A project by the French, to invade India by the way of Afghanistan, which was among the schemes of 1809, led to an intercourse between the British authorities in India, and the rulers of the Afghans,—thereby bringing within the scope of modern geography, a country which had not attracted much notice for centuries.

The portions of the Afghan territory that are of most importance with reference to India, are the provinces of Candahar and Cabul: the latter lying in the valley of the river Cabul, westward from the Indus at Attock; and the former lying farther to the south and west. But the Afghan power, ever since they lost the sovereignty of India, has been remarkably fluc-

tuating, sometimes extending along the right bank of the Indus, indefinitely toward the Arabian Sea; and also including the upper country on the left bank of the Indus, as far as the mountains in the north and east, and a portion of the Punjaub in the south. But the proper geographical boundary (the territorial one is never long the same) is the country to the west of the Indus. Thus restricted, the province of Cabul is the only part of the Afghan territory, of which the knowledge is necessary to form a correct estimate of the relations of India. The centre of that province is a valley, extending from Attock westward, with the central mountains on the north, and the Suliman ridge on the south. Many parts of it are bleak, and have the aspect of deserts; but others are of the greatest fertility. Candahar lies on the whole higher; but there are no mountains in it so elevated as those of Cabul; and, therefore, the winter is not so cold. Except that rice is produced in considerable quantity upon the rich land along the river, Cabul has little in common with India properly so called. Neither have the East India Company shewn any disposition to aid any of the parties that are so frequently contending for its government,—probably from a conviction, that such an interference would em-

broil them in the politics of central Asia, at a point very distant from any at which they have an efficient force.

The chief towns in Cabul are Peshawer, the present capital; with Cabul, which was the capital not very long ago, and is occasionally so still; and Ghizni, which was the seat of the earliest Mahomedan sovereign in these parts. Peshawer is at no great distance west of Attock. The situation is delightful in the highest degree. It stands in a valley, about thirty-five miles in diameter, surrounded by hills, that rise over each other till, especially on the north, they terminate in lofty mountains. The Cabul winds through this valley in several streams, the banks of which are in many places sandy and unproductive; but the rest of the valley is quite a paradise. Great part of it consists of gardens, producing not only the fruits of India, but the choicest ones of Europe, in more abundance and superior quality to those upon which European art has been exercised for nearly two thousand years. The pomegranate, the peach, the plum, the pear, the apple, and the quince, load the boughs, and render it not improbable that this is the native region of those fruits. Those who have investigated the progress of horticulture have been able to trace the garden fruits as far as Persia, before they could find a place

to which they had not been imported; and really it is by no means improbable that the deciduous fruit trees are natives of those valleys near the Hindû Cosh, while the evergreens, such as the orange and the citron, may have been importations into Persia from regions still farther to the south. The orange was unknown in Europe for a long time after Alexander had penetrated as far as the Ganges, and vessels, both from Arabia and the Persian Gulf, had passed by the Malabar coast to Ceylon. A great deal of trade, chiefly the exchange of Indian and Persian goods, is carried on at Peshawer; but the province is in a very unsettled state, and the capital is alternately in the hands of the Afghans and the Seik chief of Lahore.

Cabul is a beautiful city, though of smaller dimensions than Peshawer; and Ghizni, though it presents but the ruins of its imperial grandeur, is still a place of some note. But we want a good account of these countries, as, in most of what is written respecting them, the glories of the past are too much blended with the desolation of the present. These slight notices have been given rather out of place, because the countries to the west of the Indus do not properly form part of India, though in some measure connected with it; and the same will be

done with all the frontier countries, to which we shall not have to revert a second time.

CACHMERE.—This country, like Cabul and Candahar, formed a part of the Empire of Acbar; and, therefore, Abul Fazel enumerates it among the provinces of India. In all ages it has been a place of great celebrity, as well for the beauty of its situation, as for some of the products of its industry; but, like those last mentioned, it appears to have fallen from its former fame; and recently the people, or rulers, have applied for the protection of the British power, though without obtaining it.

The country of Cachmere consists of a single valley, of an oval form, having the lofty mountains on the north and east, a spur of the same, forming part of Caffristan, on the north-west, and a secondary ridge, which divides it from the hilly part of Lahore, on the south. The length of the valley is about one hundred miles, and the greatest breadth about sixty. The valley is remarkably fertile. Great part of it is level, and consists of the richest soil, most abundantly watered, with a warm but not excessively hot climate in summer, and a mild one in winter. The hills rise gradually on all sides, until, on the north, they reach summits which are always covered with snow; but even those mountains

have a mild climate to an elevation where dwellings are unknown except upon the great Asiatic ridge. Thus there are many climates, and they succeed each other in a very gradual and pleasant manner. The bottom of the valley produces luxuriant crops of rice; and there is a succession of wheat, barley, and the other grains of the cold climates, upon the slopes of the mountains. Fruits are also abundant; and, as is the case in the valley of Cabul, they are chiefly the fruits of Europe. Saffron, of a very superior quality, is produced abundantly in Cachmere, and forms an article of export. The shawls of Cachmere have long been celebrated; but though manufactured in the country, they are not a native product; for the long-haired goat of the fur or down among the hair of which they are made, is confined to the mountainous part of Thibet, and will not live to the south of the Hindû Cosh, or the Himalaya. A rival manufactory has also been set up in Delhi, where the wool can be obtained by the way of Hurdwar, so that it is probable that this staple of Cachmere will fall off.

The city of Cachmere is the largest in the extreme north of this part of India, containing, so late as 1809, a population of between one hundred and fifty thousand, and two hundred thousand inhabitants. Formerly it appears to have been

much greater, and indeed the whole country was in a much better state while it formed part of the Mogul Empire than it has been ever since. The natives are so far from being a warlike people, capable of defending their little spot of beautiful country, that their society is said completely to have enervated the Afghan soldiers, stationed there when the country was a part of the kingdom of Cabul. The Cachmerians are celebrated for the elegance of their appearance, and for their skill in the arts of peace; and were they left so unmolested that they could do justice to it, they have a very fine country,—a country capable of producing almost every luxury, and which, though surrounded by mountains, and placed high above the level of the sea, is so flat and well supplied with water, that canals might be as numerous and as useful as they are in Holland. But the peaceful inhabitants of this beautiful little valley are at the mercy of their more turbulent and savage neighbours; and one cannot contemplate without pain the idea of such a people and such a country going to ruin without any one to protect them. And they lie remote from any power that can be viewed in the light of a protecting one. They are without the range of the British influence, and other than that, there does not appear to be in India any power by

which a weak and peaceable population can be protected, however largely they may pay for protection.

LAHORE.—That is the next province on the Indus. It is a very large province, extending about three hundred and fifty miles from east to west, and at least two hundred from north to south. Its western boundary is the Indus, which divides it from the Afghan country, though, in the summit of their power, a considerable part of it was subject to these people. The boundaries on the north are formed by the Indus and Cachmere; and on the east by the summit of the great ridge of mountains. The provinces of Mûltan, Ajmeer, and Delhi, respectively, form the boundary on the south; but the habitable parts of Ajmeer are separated by a great extent of desert, spotted here and there with habitable but dry and wretched Oases.

Nearly the one half of this extensive province lies among the secondary hills through which the five rivers of the Punjaub have the first part of their course, and the other half consists of the Punjaub itself. The mountain district is very cold during the winters, and its productions have a considerable resemblance to those of Europe. The pine is the prevailing tree in the more elevated forests, and any approxima-

tion to the botany of Hindûstan Proper is unknown. Both the soil and the climate seem inferior to those of Cabul and Cachmere; and the fruits of no country thrive well but on the slope of the hills, where the soil is often collected and confined in artificial terraces. The grain crops, are, in many places, abundant. Even that part of the province which lies in the Punjaub is not so fertile as, from the name that it has got, one would be disposed to conclude. The finer particles of soil are retained among the mountains, and the deposits in the Punjaub are often little else than unproductive sand; while, as the rivers have few branches originating in that part of the country, there is a want of moisture everywhere except in the vicinity of the principal streams.

There is no doubt that, by careful cultivation under a settled government, the Punjaub might become a productive country; for, unsettled as it is, it yields enough of grain for the inhabitants, though very little for exportation. Some rice is grown; but the soil does not appear to be so well adapted for it as that in India Proper, or even in the upper valleys. Wheat, and various sorts of pulse, are the common crops. Pasturage is, however, the prevailing application of those plains. Great numbers of horses are reared in the western doab, between the Indus

and the Jhylum, and herds of oxen and buffaloes in those farther to the east. The farther eastward, the soil is naturally the more sterile; but it is more carefully cultivated. The salt range of hills passes through the province of Lahore; and the salt is of such consistency, especially in that portion of the ridge which lies nearest to the Indus, that it is worked into vessels.

In the extreme west of the province, the inhabitants are chiefly Afghans, who live in villages protected by mud walls, and are in a state of continual anarchy. The upper parts of the mountains are in the possession of a number of independent rajahs, or chiefs, who are mostly Mahomedans in profession, but who retain the titles and many of the customs of their Hindû ancestors. The lower portion of the hills, and the Punjaub, are in the hands of the Seik chiefs, who are in a state of almost constant warfare. The people are more robust and brave than those of Hindûstan Proper.

Though there are many villages in the Seik country, there are only two towns, Lahore and Amritsir. Lahore, which stands on the left bank of the Ravey, was once a large and flourishing city, and has been the seat of the imperial government; but since the dismemberment of that power, it has been subject to con-

stant plunder and calamity, and is in a state of decay. The inhabitants, generally speaking, are poor, and the houses in ruins. Great part of the province has been subject or tributary to the rajah of Lahore; but the government is one of force—unstable, and not calculated to improve either the people or the country.

Amritsir, which is about forty miles to the eastward of Lahore, is not in so ruinous a state, being revered as a holy city by all the Seik chiefs, even when they are in hostility with each other. In consequence of this, the town is not defended by walls. The buildings in Amritsir are good, and the people active; there is a considerable trade through it, and it contains a number of rich people.

Though, at present, it bears very little upon that part of India in which the British are more immediately interested, yet Lahore is a very interesting country. It is one from which the antient invaders carried off a great deal of plunder; and though it was at one time, perhaps, more completely under Mahomedan controul than any part of India, it is the one in which the condition of the remaining Mahomedan population is, perhaps, the lowest, they being, throughout all the low country, a poor and oppressed people. Should any of those political convulsions, which nobody can either foresee or

deny the possibility, but in which one is almost tempted to believe that the circumstances are preserved for the man, and the man fitted to avail himself of them,—should any of those come, and involve among its operations or results an invasion of India by land, Lahore would become one of the most important portions of the whole country; and the future invader would be able to stimulate his courage with the thought that they had drawn the sword upon the same plain where the successive invaders, for two thousand years, had sheathed it only in victory; and that while the flood of time has swept away the victors, and all effects and vestiges of their victory, the country and the people are, probably, not very different from what they were at the time of the first invasion.

Lahore is interesting in another point of view:—there is probably much mineral wealth in its mountains; and the botany of those mountains, from the very little that is known of it, appears to have something of an European character. Information is, however, wanted upon those points; and at present there seems to be no political inducement—the only inducement that operates powerfully, in the east—for the obtaining of it.

MULTAN.—In the time of Acber, when Abul

Fazel drew up his institutes, Mûltan comprised the whole valley of the Indus, from Lahore to the sea, and from the confines of Persia to the central desart; but the name is now restricted to a portion of surface, extending about one hundred miles in length and seventy in breadth, and occupying the south-west part of the Punjaub, and a portion of the desert to the south-east. The portion which lies within the Punjaub is subject to seasonal floods, or can be watered by cuts from the rivers, and, accordingly, it is fertile; but that which lies beyond the influence of the streams, is sandy, destitute of grass, covered with hard prickly bushes, and contains very few inhabitants. With the exception of the portion alluded to, this is indeed one of the most miserable countries on the face of the earth; and poor and wretched as the people are, their condition is rendered more miserable by the inroads of their neighbours. The Seiks of Lahore, the Afghans, the people of Sinde, at the mouth of the Indus, all by turns overrun Mûltan, and waste it at their pleasure, as the inhabitants are too few and scattered for making an effective resistance. The city of Mûltan is on the left bank of the Chinaub, about eight hundred miles from the sea by the course of the rivers. The country is fertile, and has once been beautiful; but the villages round are in

ruins; and that will, in all probability, soon be the fate of the city itself. The more immediate cause of the ruin of this well situated city and its fertile environs, appears to have been the payment of a large tribute to a foreign power, and then the inroads of the Sindeans and Seiks into a country previously exhausted. There is still a nominal nabob of Mûltan; but he is always tributary to the last invader. Of course some vast change must take place before such a country, separated as it is by an extensive desert, can have any influence upon the affairs of India.

Bahawulpoor occupies the Punjaub lower down than Mûltan, with part of the desert. It resembles Mûltan both in its character and its fate. The moist part of it would be rich if the people were protected. The principal town, which has the same name as the country, is situated on the Sutledj, and was once famed for its silk manufactures. Ooch, at the confluence of the Punjaub rivers with the Indus, appears to have been once a place of importance, but it has fallen off. Indeed the whole of India to the westward of the great desert, and which is without the range of European influence, appears to be the ruin of what it once was; and destined, in all probability, to be farther ruined

still; and yet many parts of it have all the physical elements of the greatest prosperity.

SINDE.—That is the name given to the country on the lower part of the Indus. Like the others it is detached from India proper by the desert, and influenced by the fluctuating politics to which the whole valley, from the mountains to the sea, is exposed; but as it has a good deal of trade with Bombay,—as the British once had a factory in the country,—as they have come in contact with the Ameers, or modern rulers,—and as British influence now extends over the adjacent provinces of Gujerat and Ajmeer, this country has more connexion with India proper than any other on the Indus. Many parts of the low lands on the Indus are fertile; but, owing to the nature of the government, that fertility is not turned to the best account. Still, as all the export and import trade (such as it is) of the valley of the Indus is carried on through Sinde, the country is of some importance now. But, looking back at the whole valley, it appears to have been divided into a number of petty states, squabbling with and spoiling each other, unless when the strong hand of foreign conquest was upon it; and such it is likely to remain, as the little states are too scattered and too turbulent for being united into a regular government,—as the country could

not pay for keeping one up,—and as such a government could not very long be supported by mere glory—even by the glory of pilfering a few villages, stopping up a few wells, and cutting down a few date palms in the desert.

INDIA PROPER—FRONTIER COUNTRIES.

When we pass the central desert, and approach the valley of the Ganges, there is a wonderful change in the country. There is no more of arid wilderness; and now, though there has been much hard fighting in order to attain it, there is no feud within, and no fear of hostile inroad from without. These are the elements of a paradise; and where their religious notions and prejudices are not interfered with, there is a population, thronged as bees, and plastic as wax, to put those elements in motion. This is not the place, neither perhaps is the present the time, for entering into any moral disquisition on the state of India; but, however it has been brought about, it is pleasant to contemplate a country so large, so fertile, so populous, and having a population who have shown themselves so passive amidst the changes of dynasties and systems of government, in a state which gives promise that they shall be exempted from war, and brought into that state without any unprecedented diminu-

tion of their numbers or accession of misery. When the whole outline of India is before us we shall be able to revert to this question, better prepared for taking an impartial view of it, although, even then, we shall probably find the data very imperfect; but it is a question that arises whenever the attention turns to the Valley of the Ganges; and therefore we mention it now, merely to show that we must put it aside, until we shall be better prepared for it.

Besides the provinces which are actually within the Valley of the Ganges, and under the immediate power or influence of the British, there is a line of smaller ones, which skirt the north and east sides, and over which the British exert an influence, but with the government and revenue of which they have not hitherto interfered to any great extent. Those countries in general occupy the hilly tract which lies between the summits of the Himalaya and the Valley of the Ganges; and the British possession has been actually extended nearly five hundred miles eastward, along the valley of the Brahmapootra, and southward along the Bay of Bengal, to nearly the 18th degree of latitude; but those recent accessions, which were the results of the Burmese war, are now portions of the province of Bengal.

SIRHIND.—That country is within the pro-

vince of Delhi, of which it occupies the north-west corner, having the Sutledj and country of the Lahore Seiks on the north; the desert on the south-west; and the British province of Delhi on the south and east. This country is in general an arid waste, the few streams that are in it flowing toward the south-west, and being lost in the desert. It is inhabited by independent Seik chiefs; but the British have a military station at Ludheeana, near the banks of the Sutledj. This part of India is famous in history as the scene of many of those battles which, during the numerous invasions, decided the fate of the country; and the town of Sirhind was once a place of some consequence, but it is now in ruins, as are also the canals from the Sutledj, which the Mogul Emperors planned, and partly executed, for the purpose of irrigating and rendering fertile this thirsty land.

GURWAL, or *Gurhawal*, is the next mountain province to the eastward, or rather to the north-eastward of the Seik possessions in Sirhind. In the north-west it extends to the banks of the Sutledj; in the north-east to the summit of the Himalaya, and on the east and south, to the British province of Delhi,—extended somewhat beyond the limits which it had in the time of the Moguls. Formerly it used to extend southward to Hurdwar, where

the Ganges enters the plain, and eastward to the confines of Nepâl; but its boundary is now restricted to the Alacananda branch of the Ganges; the remotest source of which, the Dauli, rises on the other side of the Himalaya; and Sirinagur, its former capital, is within the British boundary. Though a remarkably mountainous country, some parts of Gurwal are very fertile. The branches of the Ganges are fine streams, and some of the slopes and valleys are remarkably beautiful. From its south-western aspect, too, the climate is more mild than from the great elevation would be supposed. By the last arrangement with the British, the court of the Gurwal rajah is fixed at Barahaut, on the right bank of the Ganges, about forty-eight miles north-west of Sirinagur, which, previous to being raised to this honour, was a village, consisting of a few miserable hovels, buried among weeds. The rajah administers the affairs, and pays the expenses of his government; but he is protected by British soldiers, and, in fact, completely the servant of the British. The region is important in Hindûstan, as containing the holy ground whence the deified streams of the true Ganges issue.

KUMAON, though now a British possession, and, as such, forming an integral part of the

province of Delhi,—Kumaon is so recently acquired, and so similar in its character to the states of Gurwal and Nepâl, between which it is situated, that the consideration of it as separate, is more accordant with that geographical arrangement which makes the permanent features of countries a key to their political divisions. In this point of view, Kumaon is a sort of four-sided-figure, extending about ninety miles in each direction. The low country of Delhi is on the south-east; the summit of the Himalaya on the north-east; Gurwal, separated by the Alacananda and Dauli branches of the Ganges, on the north-west; and Nepâl, separated by the Cali branch of the Gogra, on the south-east. Kumaon is important, as commanding some of the best passes across the Himalaya; and it contains mines of copper, and, probably, also of other metals.

One of the greatest general advantages (besides that of putting an end to the feuds and squabbles of the mountain chiefs) which will result from the occupation of this part of the Himalaya by the British, must be the information that they must, in the course of time, obtain of the structure and appearance of the Himalaya in particular, and of the geography of the central parts of Asia generally. Already, more is known of this country than of any

other on the same lofty ridge; and it may not be amiss to notice one or two particulars:—

From the Ganges at Hurdwar, or, eastward, but bending a little to the south in the middle, to the Cali branch of the Gogra, a distance of about one hundred miles, may be considered as the termination of the plains of the Rohilcund district of Delhi; and the ground begins to ascend, and is covered with thick brushwood, at first interspersed with marshes, as is very common along the base of mountains. After a little ascent, the trees are of larger size, though still of the same species, or, at least, genera, with those that are found in the plain. As the ascent is continued, the tropical vegetation begins to disappear; rhododendron and its associates become the bushes; the oak and the pine the trees; the flowering plants and scandent epidendra give place to ferns, mosses, and lichens; and the brakes are filled with wild raspberries, barberries, brambles, thorns, and briars, intermixed with hollies, willows, wild pears, and mulberries, according to the nature of the soil. The larger annual plants are, various kinds of nettles and thistles; and the whole has the character of a tangled wild in Europe. This begins to be the prominent character at an elevation of between two thousand and three thousand feet; and above three thousand feet it

is general for a limited height. Those trees at last become few, and the prevailing class is the pine, of which there are several species, some of them of great size; and with them we should expect the vacciniums, some of which have been mentioned. As the ascent continues, the pines become fewer, and are found only in straggling clumps, and of stunted dimensions; while, just as we would expect upon the mountains of Norway or Scotland, the birch, gradually changing to the dwarf species, is the last tree, and moss and lichen the only vegetation near the snow; and long before the twenty-six thousand feet, which is about the elevation of the most lofty summit in Kumaon, is reached, (if reached it shall ever be by mortal foot) there will, of course, be an end to all vegetation. The tiger is mentioned as being abundant in this upland country, and found even near the snow; but the probability is, that the animal taken for the tiger may have been some other of the feline race, better adapted to the rigour of the climate. Years of observation will be required before even an idea can be formed of the advantages that science may reap from the British occupation of Kumaon, if that occupation be turned to proper account. Nowhere has study so great a range of elevation: and that within a few

days' march of the rich plain of the Ganges, and in a country of which the valleys could be rendered very productive.

NEPAL.—Nepâl occupies the next, and by far the largest, portion of the hilly country between the Himalaya and the plain of the Ganges. Nepâl extends from the Kali branch of the Gogra, which divides it from Kumaon, nearly five hundred miles south-eastward, to the bank of the Conki, by which it is separated from Sikkim. On the east it may indeed be regarded as bounded by British territory, for a spur belonging to the British stretches half way to the Himalaya, between the Teesta and the Mitchee, an eastern branch of the Conki; and the Rajah of Sikkim, whose small territory lies between the British frontier and the mountains, is under the British protection. On the south-west it is bounded by the plain of the Ganges—the povinces of Delhi, Oude, Bahar, and Bengal, which are in the actual possession of the British along the whole boundary, with the exception of about sixty miles which still belongs (nominally) to the Nabob of Oude. The northern boundary is the Himalaya, the adjoining country, Thibet, and the ruling people, the Chinese. The breadth in this direction is, on the average, rather more than one hundred miles.

Nepâl is opposite to the most elevated part of the Himalaya; and the base of those mountains occupies a broader space than at the sources of the Ganges and Jumnah. The courses of the rivers, too, are a little different. The Dewa, or eastern branch of the Gogra, indeed, flows across the west end of Nepâl, nearly at right angles to the length of the country; but farther down, the Gunduck, and afterwards the Cosi, take directions nearly corresponding with that of the centre of the country, till, turning to the right, they escape through passes in the hills which separate the valley of Nepâl from the plain of the Ganges. Those passes, and also the passes from several of the interior valleys to others, have all the appearance of having been worn, through a long succession of years, by the action of the streams; and therefore there is every probability that the whole valley generally, and the individual portions of it severally, may at one time have been lakes. Like the Vale of Cachmere, and that of Peshawer in the province of Cabul, they contain a great portion of rich alluvial soil. In the valley of Nepâl, there are two great natural divisions—one in which flows the Gunduck and its branches, and another that contains the Cosi. Catmandao, the capital, is situated upon the elevated ground between the sources of branches

of those two rivers, and is elevated about four thousand five hundred miles above the level of the sea. It is but a small town, and by no means splendid. The eastern branch of the Gunduck (the Bogmutty) comes from several valleys that lie to the north of the capital, while the principal or eastern branch comes from the eastern side of the immense mountain of Dhawalaghiri, farther to the north-west. There is another city, Ghooka, about forty miles to the north-west of Catmandao, which has the same name as the people who now have the chief rule in Nepâl; but there is not much known respecting it.

The several valleys of Nepâl have great varieties of elevation and exposure, so that the productions are very varied. In one valley the bamboo and the rattan form jungles, as luxuriant as in the low country; in others, hardly any tree is to be met with but the pine and the oak; the crop of one valley is barley or millet; that of another consists of sugar-canes, in a state of luxuriant perfection. The periodical rains, which, attracted by the lofty mountains, fall with much violence, are very unfavourable to the ripening of fruit; but the orange succeeds well, as it comes to perfection in the dry season; and, for a similar reason, the pine-apple is excellent in those plains that

are warm enough for bringing it to maturity. The mountain slopes are often cultivated in terraces, after the Chinese fashion; and as, from the perpetual reservoir in the snow upon the lofty summits, abundance of water can always be commanded, that mode of cultivation is successful.

The mineral riches of Nepâl have not been examined with much care. Iron, lead, and copper are said to be plentiful, and zinc and gold have also been found. But still the mineralogy of the whole range of the Himalaya and the Hindû Cosh may be considered as an unstudied subject.

Sikkim.—The small state of Sikkim is situated on the south-east of Nepâl, in absolute position, though the Nepaulese territory, in part, bounds it on the south. That portion is the Morung district, from which Sikkim had been invaded by the Gorkhas of Nepâl, before the interference of the British. The other part of the southern boundary of this little state is the British frontier, and it extends thence to the Himalaya, a distance of about sixty miles; while its extent in the other, from the Conki, on the frontier of Nepâl, to the Teesta, on that of the territories of the Deb Rajah of Bootan, is about forty miles. The upper part of this small state is very mountainous, and the lower

part, though fertile, is overrun by jungles, and unwholesome; so that, considered in itself, it is not very important. With regard to the general politics of Asia, it is, however, of far greater consequence. The most easy communication between the rulers of India Proper and the Chinese authorities in Thibet, is through the passes of Sikkim; and since the British influence predominated with the rajah, some communications have taken place, of a more friendly nature than the usual character of Chinese intercourse.

There is another advantage in maintaining the independence of Sikkim. A short time ago, the Gorkhas of Nepâl were pushing their conquests, both to the east and the west, with so much vigour and success that they would soon have encircled the Valley of the Ganges with a cordon of their power, by means of which they would not only have cut off all communication between the countries on the different sides of the mountains, but might have committed depredations on the plains, and regained their fastnesses before they could have been followed. The two breaks which the British power has made in this line, by their dependent in Gurwal, and their own territory of Kumaon on the west; and by their dependent of Sikkim, on the east, have put an end to

even the chance of so formidable a combination, while they have at least laid the foundation of an internal intercourse across the mountains. Now, as the prejudices must in time subside, and as, from the great difference of the productions of the countries on the opposite sides of the mountains, an exchange, to a greater extent than has yet been carried on, would be of the utmost advantage, the opening of the two passes to the Chinese frontier must be regarded as an important service done to the commercial liberty of Asia.

BOOTAN.—This name, which is by the Hindûs applied to the whole line of the mountain country, from the pass of the Indus, to as far east as the Himalaya have been explored, and which has been used by some geographers as a synonyme for Thibet, is generally now restricted to the portion of country on the south side of the mountains, to the eastward of the Teesta, and thence, probably, about two hundred and fifty miles in the same direction, though its limits have not yet been explored. The breadth varies; but upon the average it is about ninety or one hundred miles.

Bootan is, in its physical appearance probably the most singular country in the world. It is the land of extremes. Summits clad with perennial snow; huge cliffy rocks, upon which

there is no vegetation ; hills verdant with forests, and dells abounding in streams, and excessive with vegetation, are blended together in the most wonderful manner. Along the margin of this singular inland country, there extends a hill, or border of plain, equally singular. The rains do not fall in so heavy torrents, or the rivers so tear their banks as in many other places. The alluvion is accordingly brought slowly down, and laid along by the base of the mountains in a porous stratum, through which water bubbles up in all places, and at all times, while from the situation and the latitude, the heat in summer is excessive. But, from the melting of the snow, the absorbent and porous nature of the soil, and the overshadowing influence of so much vegetation, this low land is never dried ; and the only effect of the summer heat is to quicken the vegetation, and envelope it in steaming exhalations, which are rank with the most pestilent miasmata. This plain, which is more than twenty miles in average breadth, separates the Bootan hills from the cultivated fields of Bengal ; but it sheds its baneful influence partly upon these. It presents the singular spectacle of a wilderness produced by the excess of vegetable energy, and the means by which that energy works. The forest trees upon it are of great bulk, and they are full of underwood,

among which the elephant and the rhinoceros are the principal inhabitants.

Beyond this formidable barrier, through which there are passes, the country is not unhealthy, and it supports a race of mountaineers, who are strong and brawny compared with the natives of Bengal. There are great variations in the climate; and while the inhabitants of the valleys are obliged to shade themselves from the destructive influence of the sun, those of the mountains are shivering amid snow and ice; and yet they are within sight of each other. Some of the mountains are of great elevation. Tchamalari, which looks down from the north upon Tassisudon, the capital, and is said to have in the bosom of its vast precipices, toward the north, an extensive lake that never thaws, has an elevation of very nearly five miles perpendicular; and the country contains every variety of altitude between that and the plain of Bengal.

When the more elevated parts of the country are reached, vegetation is found to have that European character which is so characteristic of the whole range of the Himalaya. The oak, if found at all, is not so common as farther to the north; but ash, and maple, and yew, are met with, and these are succeeded by pine and birch. The strawberry and the

raspberry grow wild, mixed with thickets of bramble; and most of the fruits cultivated in Europe are found. The walnut, the mulberry, the pear, the apple, the peach, the pomegranate, and the orange. Even the turnip is met with, far better than in the warmer parts of Europe, and equal to that of Scotland, or of the north of the Continent. But, in every thing relating to it, Bootan is a singular country.

Assam.—That is the common name of the valley of the Brahmapootra, at least of the lower part of it—for the inhabitants of the southern slope of the Himalaya are called Bhooteas, as far as the country is known. Assam, too, has undergone many political changes since the close of the sixteenth century, when Abul Fazel described its monarch as "a powerful prince, who lives in great state, and when he dies, his principal attendants, both male and female, are voluntarily buried alive along with his corpse." The latter is no unusual occurrence in this part of the world, and it is no proof of power. So late as the year 1816, one of the rannies, or queens, and five of the principal female attendants of the Rajah of Nepâl, voluntarily burned themselves on the same pile with the body.

As to the power, again, it has been the inva-

riable fate of all native states south of the Himalaya, to "come like shadows," and "so depart," and a geography of that part of the world, drawn up according to the territorial boundaries at any one time, would be a map on the sand—the wave would have swept away some of its lines, before the maker could announce its existence. Political distributions are *events* everywhere; and here they are events of so fleeting a nature, that even the historian that would keep pace with them must have the wings of an eagle perpetually on the stretch. The geographer must lay hold of the rocks and the mountains, as the only certain criteria of prolonged identity.

The low grounds of Assam, along the Brahmapootra, are at present woody, swampy, and pestilent; but they appear to be so only because they are neglected. On the mountains the air is healthy, and the weather mild. Nature, certainly, has done her part; and is no more to be blamed for the pestilential swamps that have been occasioned through the neglect of her bounty, than she is for the dead bodies which, floating down the sacred Ganges, are alike offensive to the senses and the feelings of an European. Mankind should not be alarmed at a swamp, even though it be unhealthy, and infested with wild beasts. It is but yesterday since

the wind could not shift to the east without half of England shaking in an ague, since "the plague of leprosy" was in every parish, and since London was half depopulated by pestilence. Where are those calamities now? Ask the pick-axe, the ploughshare, the mattock, and the broom! And what these have worked in one country they would work in another. The length of the river, the vicinity of the sources of the Irawati and of China, render this the most interesting part of the Indian frontier; and if British influence continues to preponderate in India, it must extend in this direction.

South of the bend of the Brahmapootra, the British territory extends for more than five hundred miles along the coast, and includes the territories of Silhet, Chittagong, and Arracan, —influencing, in fact, the whole of a most varied and valuable country, as far as the frontier of China.

SILHET.—This detached country, which lies on the left bank of the Brahmapootra, occupying the lower part of a valley formed by the Garraws Hills on the north, and the Tipera Hills on the east and south, has been a portion of Bengal since the time of the Mogul Emperors; but of late years it has been extended till it includes the whole of Cachar, and thus occu-

pies a space extending about one hundred and forty miles south from the Brahmapootra, and hundred miles eastward. The river Soorma, which falls into the Brahmapootra, about the middle of the west side, is navigable by boats, and so are several of the other streams, of which there are many.

The soil is very rich; but the low lands are flooded during the rains, and there are many swampy jungles and damp forests toward the hills, which render the air unwholesome. The surface toward those hills is very irregular, and some of them, which are very precipitous and difficult to pass, rise to the height of five thousand or six thousand feet. The possession of this province commands the whole of the Brahmapootra, and the little states as far as the frontier of China. The country is susceptible of great improvement, and appears to have received very little. In the time of the Moguls it was a slave-market for Bengal, and the traffic is not yet wholly abolished; though the established influence of *one* authority within all the natural boundaries must contribute to the ultimate improvement of all parts.

CHITTAGONG.—The Chittagong district occupies about one hundred and fifty miles of the east coast of the Bay of Bengal, immediately south of the extended territory of Silhet, and it

stretches inwards about fifty miles. There are several large and low islands in the eastern estuary of the Ganges off the coast of Chittagong, the chief of which are Hattia, Sundeep, and Bameeny; and among these, the sea is often very violent and dangerous during the monsoons. As this country meets the monsoon immediately from the sea, and as the country in the immediate neighbourhood is high, and the air cold on the summits from the evaporation occasioned by the immense masses of foliage in the forests, the climate is remarkably rainy, and cannot, in its present state, be healthy. The sea coast is often in floods, in the contest between which and the waves of the bay, the land is often washed away; the bottoms of the hills are forest and jungle, the habitation and the delight of the elephant; and though the hills must be fertile, and should not be unhealthy, they have not been much visited by Europeans. It has been already mentioned, that there is abundant of timber, well adapted for ship-building, and also a good harbour, at Chittagong; but, from the great humidity of the soil and climate, the timber is not so good as that of the same species which grows upon the comparatively dry hills on the Malabar coast.

ARRACAN lies immediately to the south of the Chittagong district, occupies about two

hundred miles of the coast, and reaches indefinitely (probably about fifty miles) inward. The greater part of it is covered by one continuous jungle, which extends from the hills to near the sea; and the coast land so alternates with portions of water, that almost the only passage is by boats. It is a country of perpetual rain; and between June and September inclusive, there falls as much as two hundred inches, or about as much as falls during ten years at Upminster, in Essex. Vegetation is, however, excessively vigorous, and the land toward the hills is strong and good; but at present the whole country, especially the capital and its neighbourhood, is pestilent and not fit for the abode of Europeans.

After about one hundred and forty miles of coast to the south, and rather more to the east, comprehending in the latter the mouths of the Burmese rivers, a British territory again occurs on the coast—the districts of Martaban, Tavoy, and Tenasserim, or Mergui. Taken all together those districts stretch along the western shore of the Eastern Peninsula for a length of between four hundred and five hundred miles, and reach about fifty into the interior, though their boundary in that direction is not very definite. They are acquisitions since 1825, and very little is yet known respecting them.

MARTABAN.—The British portion of this province (that upon the coast, from the river Salaen southward) extends about seventy miles in length, from about lat. sixteen and half to lat., fifteen and half, and indefinitely to the eastward to the mountains of Siam. When this country came into the possession of the British, it had been almost depopulated, and had reverted to a state of nature; and yet, under this disadvantage, it is a country of some promise. As the peninsula is very narrow, the heat is not so oppressive as in Bengal; the rains are not so constant as in Arracan; and thus the climate is far more healthy. In the meantime, the greater part of the surface is overrun by forest; but in the little spots that have been cleared, the soil is excellent; and the vigour of the forests is a proof that where they are it is equally so. Indeed it is difficult to point out a country better adapted for all sorts of tropical productions; and it is free from the moral objection which often lies against settlements. When it came into the hands of the British, it was *nobody's country*. In addition to the great length of sea coast, this district has the advantage of navigable rivers—indeed almost every torrent becomes navigable during the rains.

TAVOY, including Tenasserim or Mergui, occupies about three hundred and fifty miles of

the coast to the south of Martaban. Along the shore there are many islands and rocks, some of the former of considerable extent and fertile; the margin of the land abounds in rich alluvial flats, separated by rocks and inlets of the sea; and the country behind is mostly forest and jungle; but the soil is of the very best description, and the climate is healthy.

This coast indeed, all in a state of nature as it is, is a rich treasure, compared with even the fertile plains of Bengal; and, under proper management, it might soon repay the cost of the Burmese war—not in wealth alone, but in human happiness. It is as if India and the Oriental Archipelago were blended together. The rice, the indigo, the sugar-cane, and the cotton of the former, may all meet with their congenial soils, whether they require the wet system of husbandry or the dry; and upon the hills, in addition to all the native or imported fruits that grow in India, there are those glories of the vegetable kingdom, the mangosteen (*garcinia mangostana*), and the durion (*zebethinus durion*), which cannot be matured in India, or in any place west or north of the Strait of Malacca, but this delightful coast. Nor is there any reason to doubt that, along with these, the most delicate of the favourites of Pomona, there will be found, or may be introduced, the

clove, the nutmeg, and "all the spices of the East;" and that merchants will not "bring their spicey drugs" alone "from Ternate, and Tidore;" but that the paradise of the Muloccas, will be realized upon the shores of the Bay of Bengal.

Some apology may be necessary for the introduction of those brief remarks, by which the course of our simple enumeration is rather interrupted; but it is so seldom that a great and unexpected good comes out of the evil of war, that one cannot help feeling it when it does come. Here is an extent of country capable of maintaining in comfort, say ten—say twenty (for the produce of irrigated rice plains is unbounded) millions of human beings; and no place can be more advantageously situated for commerce;—here is the chosen spot of the earth—not captured over the bleeding bodies of its inhabitants, and the smoking ruins of their villages; but won from the wilderness—redeemed from the destruction of excessive fertility,—from the running to waste of those powers of Nature which, if but half directed, would make millions happy. This, too, has been done in an age when much of the prejudice, and, as one may hope, a good deal of the shortsighted selfishness and cruelty of adventurers, have been got rid of, and the identity of

interests, in the rulers and the ruled, is better known at least than at any former period.

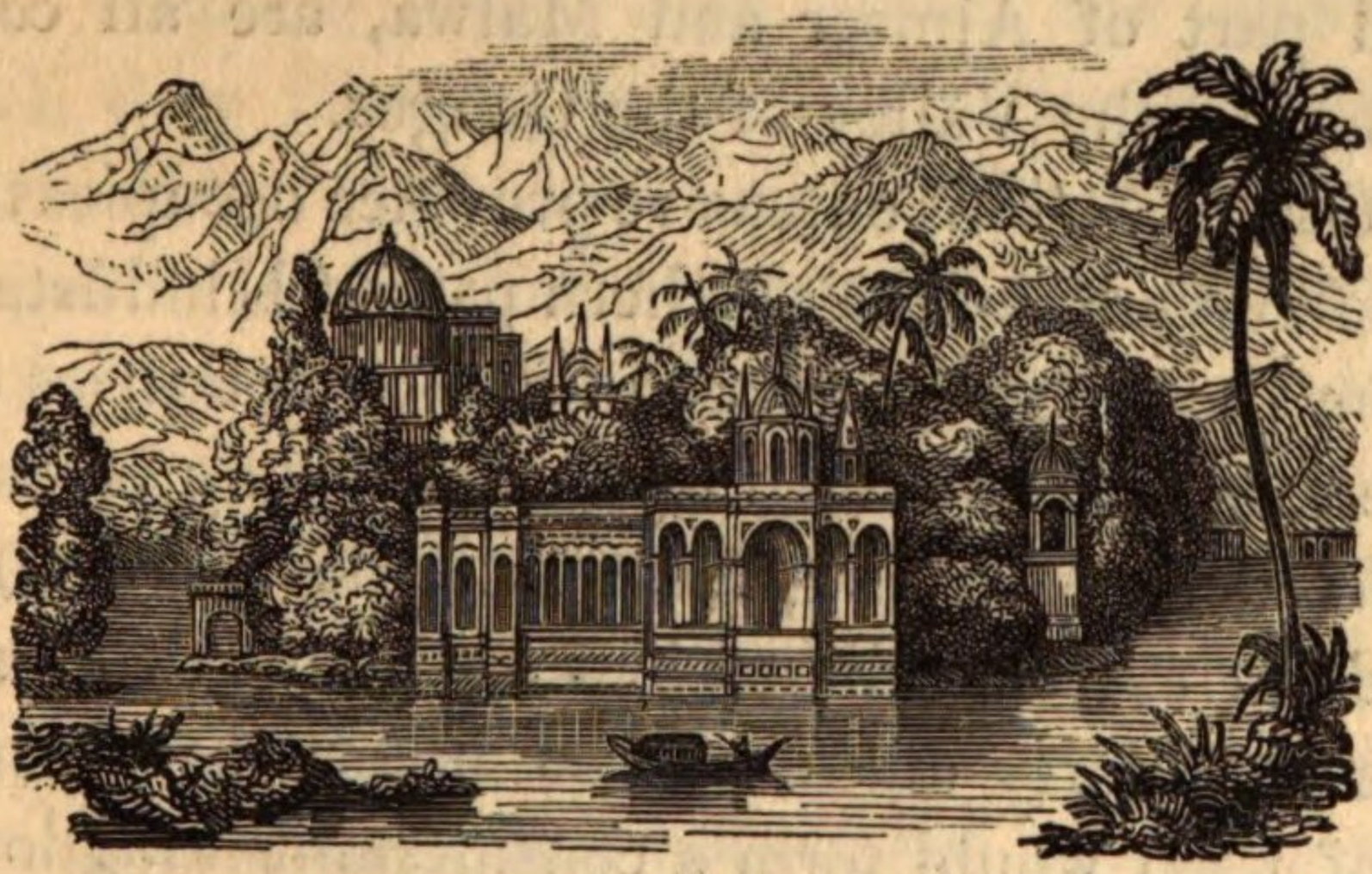
One very conspicuous advantage of this most recent addition to the British empire in India is the great facility with which, by means of the monsoons, it can be reached; and the safe landing that there is for a much longer period of the year than upon the coast even of Malabar. The Mergui Archipelago is a farther protection; and are in fact safe harbours for all the fleets that could by possibility be collected. They are elevated and rocky; they extend from north to south, in a succession of chains, sometimes as many as four or five; the channels between them are deep, and even while the sea on the outside is foaming with all the fury of the monsoons, the water in the inner channels is as still and placid as that of a lake. Those channels are so many too, and they lie in directions so varied, that no wind can blow from which a ship shall not be able to find shelter. The islands which lie nearest to the coast are fertile, and those farther out are rocky and covered with timber. A complete survey has not been made; but it appears that there is an abundant supply of fresh water in all the islands. The possession of the Mergui Archipelago has another advantage. In times of war they harboured privateers; and during the

late war, the British trade in the Bay of Bengal suffered from French vessels that were sheltered and refitted among the Mergui islands.

We have dwelt a little in detail upon these eastern frontiers of India, because they are the least known to general readers; and because, besides the interests that they have in themselves, they have an additional one as connecting India with the east of Asia.

CHAPTER VI.

PROVINCES.



PALACE AND LAKE—ODEYPOOR.

In the enumeration of the remaining divisions of India, we may be more brief,—they are better known to general readers, and they possess interest only as parts of one general whole, to which we shall have to advert afterwards.

Still the leading positions are essential to the obtaining of a clear and correct view of the subject; and, therefore, we shall enumerate them, in the several greater divisions of India, with as much brevity as possible.

INDIA PROPER.

The provinces contained in this division, east and south of the desert, are Delhi, Ajmeer, Agra, Oude, Gujerat, Malwa, Allahabad, Bahar, and Bengal. These all lie compactly together; and, with the exception of Gujerat, and part of Ajmeer and Malwa, are all contained in the Valley of the Ganges.

DELHI.—This extensive province occupies the whole breadth of the northern part of Hindûstan, from the central desert to the hilly countries on the east. From north to south, it may be considered as extending from latitude 28° to 31°; and its extreme dimensions are about two hundred and forty miles by two hundred; so that it of itself would form a considerable kingdom. On the north, the Sutledj separates it from Lahore, and the hills from the mountain states, except in the Kumaon district, where it extends to the summits of the Himalaya. On the north-east, the Cali branch of the Gogra separates it from Nepâl; and the Oude forms the remainder of the eastern boundary. Agra and

Ajmeer form the boundary on the south; and Ajmeer and Lahore that on the west.

The general slope of the province of Delhi is to the south, being that of the beds of the Ganges and Jumnah, by which it is traversed; and in the cross section the greatest elevation is a little to the west of the Jumnah; which elevation, to the north of the city of Delhi, becomes a ridge of low hills, that joins the mountains between the Jumnah and the Sutledj. Though the Ganges and the Jumnah rise in the same mountains, and have their sources at no great distance from each other, the effects which they have upon the countries through which they pass are very different. The Ganges is a fertilizing stream; the deposits which it makes are mud, and where its waters overflow, an increase of vegetation is always the result. The deposits of the Jumnah, on the other hand, are washed and unproductive sand; and its waters are so impregnated with carbonate of soda, that they poison the useful vegetation wherever they come. Neither the sand nor the salt, however, appears to come from the mountains, but to be taken up in the wide plain above the city of Delhi.

Aridity is the character of the whole province, to within a short distance of the Ganges; and constant attention is demanded to prevent

the Jumnah from flowing, for a considerable part of its course, across a desert of sand and salt. Those means had, during the long succession of troubles that followed the death of the Emperor Aurungzebe, in 1707, been suspended; and when, in 1803, the British gained the ascendancy, and the representative of the mightiest monarch of the east became their stipendiary, the city of Delhi was in ruins, and the country around in desolation. As the banks of the Sutledj are approached, the country is not quite so arid and desolate; there are abundance of mango-trees, and the people obtain crops of wheat, barley, and pulse; but even there they must have recourse to artificial watering in the dry season; and the earth is not retentive enough for affording a supply till they have dug wells to the depth of at least eighteen feet. That is nothing, however, to the state of things farther to the south. The rivers that rise in the upper part of the Seik states, in Sirhind, are all lost in the desert; and appear to be really shortened of their former courses, which *may*, at some very remote period, have extended all the way to the sea. In the dry season they now barely reach the Hurriana district, on the south of Sirhind; and in the lower parts of their courses, the water is then brackish and bad. When the rain does

come they overflow their banks, and the fields for a time look green and gay; but they do so only for a time: and the husbandman must either see his crop wholly perish, or, under a burning sun, and in an atmosphere caustic with saline effluvia, draw a scanty supply of brackish water from a depth of two hundred feet. Of these temporary rivers, Sereswati, which was once the most celebrated, has now nearly disappeared; and had the troubles, and consequent neglect of the arts, with which the country was afflicted for a century previous to 1803, been continued for a century or two longer, there is every probability that the Jumnah would have become a seasonal stream, shortening more and more every season, and that the drifting sand would soon have invaded the sacred Ganges itself. As it was, the country around Delhi, which has no natural supply of water but from the Jumnah, had become nearly uninhabitable; and there was nothing wherewithal to refresh vegetation and quench thirst but the saline and pestilent water of the Jumnah, or that water drawn from wells, where, instead of being purified by filtration, it had imbibed more deleterious ingredients from the tainted soil.

This is not the place to tell the tale of the imperial city of Delhi—

" Where the gorgeous East, with richest hand,
Shower'd on her kings barbarick pearls and gold,"

and showered it upon her kings only; but it is impossible to omit noticing Lord Lake's entrance into the city on the 12th of September 1803, as the only time when a conqueror came within its walls, for peace, and not for plunder—to build and not to burn. In the better days of the Mahomedan empire (it was not Mogul, though vulgarly called so, for Baber, the founder, was a Turk, and disliked Moguls so much, that he would not have been very well satisfied with the name of his dynasty), the city of Delhi had been watered, and the surrounding country rendered fertile, by water brought in canals from the Jumnah, higher up than at the place at which it becomes impregnated with carbonate of soda. These canals had been dry and in ruins for a long time; but the British began the repairs of one (Ali Murdun Khan's) in 1817; and as, in the summer of 1821, its fertilizing and healthful tide approached the city, the delighted inhabitants thronged to greet its approach, while the gods of all the mythologies of the East, were implored to shower down their blessings upon the generous benefactors of the grateful multitude.

The Rohilcund district of the province, on

the left bank of the Ganges, and eastward of that river, to the banks of the Gogra and the province of Oude, is a very different country; being equally famed for the fertility of its soil and the mildness of its climate. Beside the Ganges on the west, and the Gogra on the east, there are many fine streams, rising in the hills of Kumaon, that traverse the whole length of the country. By these, and by canals and reservoirs, that have been formed from them, the country is well watered. The sand of those streams which issue from the hills of Kumaon, contains a considerable quantity of gold dust, though no mine of that metal has ever been worked in India. Gold dust is found, however, at different parts throughout the whole length of the Himalaya, from the tributaries of the Indus to those of the Brahmapootra.

But the wealth of Rohilcund does not consist in its gold, but in its vegetation; and it is only on that account that it is wealthy. Of all countries in the world, gold-producing ones are the most wretched to the inhabitants; and of all trades, that of a seeker for gold is the worst.

The produce of the East and of Europe are found together in this part of India—sugar-canes and wheat, palms and apple trees. But during the last twenty-five years of the eighteenth

century, the country was sadly wasted; and though its recovery be begun and progressive, not more than half of the surface is under cultivation.

AJMEER.—This province lies nearly in the centre of Hindûstan, upon the south-east side of the desert, and through the greater part of its extent, partaking very much of the same dry and dismal character. Where, however, water occurs, the Oases are beautiful, and their beauty is much heightened by the sterile aspect of the surrounding space. The boundary to the west is Sinde; to the north lie Mûltan and part of Delhi; to the east, Delhi and Agra; and to the south Malwa and Gujerat. Though not a productive province, it is a large one, the length from north to south being about three hundred and fifty miles, and the breadth from east to west about two hundred and twenty miles. From the nature of the adjoining districts, the boundaries on the west and north are not very definite. As the greater part of the province belongs to the Rajpoot princes, who are under the protection of the British, the province of Ajmeer is often designated Rajpootana. In crossing the country from the Shekawutty district (that which lies to the south of the Hurriana district of Delhi) to Bahawalpoor, on the Sutledj, and about sixty

miles south-east of the city of Mûltan, the character of the northern part of Ajmeer is best seen. That distance is about three hundred miles; and for the last hundred, there are no inhabitants, no vegetation, and no water; but one waste of sand, which no art of man could reclaim to any purpose of usefulness. This complete desolation extends from the country of Bahawalpoor to Poogul; and the sand is flat, as if the very winds of the desert had abandoned it; indeed it rather resembles clay than sand; it is consolidated to the consistency of a brick, and ring under the foot. Such a surface is quite impervious to moisture, and must instantly discharge from its surface the whole of the rain that falls upon it: while the dew only moistens the saline encrustation, which crystallizes again the moment that the sun acts upon it. From Poogul to the frontier eastward, the general covering of the surface is still sand; but it seems as if whirlwinds had been let loose upon it in all directions. The loose sand is moulded into conical hills, resembling those that are often met with where two adverse currents of wind and tide meet upon a sandy beach. These hills vary in height from twenty to one hundred feet, and, according to the accounts of the inhabitants (for there are human beings in

this miserable country), they are continually shifting their places. Those hills are, in fact, the armies of the desert, standing ready to advance their files, and scatter their desolating flood upon the eastern part of Ajmeer and the contiguous portion of Delhi, the moment that man remits his irrigating and watering operations; and it must be admitted that, in the century of misrule and destruction, to which allusion has been made, these inroads were most destructive. The cause of their formation we shall at least attempt to explain, when we have collected all the local facts, and come to inquire thence how the elements work in India.

Though the accommodation of the people here be both wretched and precarious, their labours are severe. Their habitations are little huts of straw, very much in the form of bee-hives; their little fields produce only the smallest and worst of leguminous plants, and the raising of the small millet *(holcus spicatus)*, is attended with more labour than that of the richest produce of more favoured countries. The periodical rain and the dew are not adequate to the production of this scanty crop, and, therefore, the people have to perforate the earth—no easy task, where the soil is loose and

sandy to the depth of three hundred and fifty feet; and, even then, the quantity of water which they obtain, is small and bad.

But yet, in this dismal country, we meet with one of those provisions of Nature, which strike us so forcibly by their being found where we would least expect them. The chemical powers of vegetables have not been very minutely attended to: and the subject is of a very nice and delicate nature; but there is a power in some plants by which they are enabled to collect the elements of water, and combine and condense them into that fluid, without the presence of any water ready formed. We have instances of this in many of the orchidious plants of warm countries, which hang with their bulbs suspended from a dry and withered portion of a tree, and yet have their leaves and petals full of juice; and on the arid wastes of Ajmeer, the water-melon *(cucurbita citrullus)*, the most juicy, cooling, and thirst-assuaging plant that grows, is found in great abundance and vigour, even where the dry millet must be moistened from the wells. It may be found, that such a plant as the water-melon, growing in a desert of sand, performs some important operation in nature, separating the hydrogen from exhalations that would be pestilent, and leaving their other component parts to fall harmless to the earth; and

combining that hydrogen with the oxygen of a portion of the air; and it is a fact that, upon deserts where such plants are found, the hot winds are not so pestilent as where there is nothing but mineral action.

This desert, which approaches close to the bank of the Chinaub below Ooch, extends southward till it merges in the great salt marsh of the Rinn, toward the confines of the Sinde, Cutch, and Gujerat, in the south-west; thus, it may be said, in a curve, concave toward the south-east, to inclose the half of the more habitable part of Ajmeer.

The south-west of Ajmeer, crosses to the south of the Mhye, which descends to the Gulf of Cambay; and the middle of the south side crosses the Chumbul; the Banass branch of the Chumbul also passes along a considerable part of the country; but still it is very destitute of rivers. The traditions which are current among the people of Ajmeer, who, from the strength of the desolation with which they are surrounded, have not been so subjected to conquest as those who dwell in the better part of India, tend to confirm the opinions advanced in the notice of Delhi, that the streams of Sirhind, which are now drank up by the desert, had once found their way to the ocean, or, probably, to an inland bay, the filling up of which by the sand

carried down by those rivers may have filled it up and produced the Rinn; those people speak of times when their country was traversed by long rivers, flowing from the north-east to the south-west.

On the west Ajmeer is hilly, and the ridge of Aboo, near the boundary, has some peaks about two thousand feet high; but such an elevation is uncommon in the province. In that quarter there are some beautiful little lakes, with rich valleys, and romantic hills around them, affording picturesque views; but still there are unproductive tracts that intervene. In the eastern part of Ajmeer there are some lakes, from which a considerable quantity of salt is made, by the common Indian method of evaporating by the heat of the sun.

Agra.—In this province we again have the course of the great rivers. Agra lies to the east of Ajmeer, whence it stretches eastward to the confines of Oude and Allahabad; and in the direction of north to south it extends from Delhi to Malwa. There are three natural portions of the province of Agra, separated from each other by the great rivers, which have distinct characters. These are, a sort of table land, lying immediately to the east of Ajmeer, and having the Jumnah on the east, and the Chumbul on the south; a hilly and uneven

country lying on the south of the Chumbul, and extending to the confines of Malwa; and the Doab, or flat country, between the Jumnah and the Ganges, reaching to Oude on the east.

The first, or table land division, has a range of hills on the west, in which a few small streams originate; but few of them find their way either to the Jumnah or the Chumbul, even during the rainy season; thus the table land, which is flat, and from sixty to one hundred feet above the beds of the rivers, may be regarded as a dry country, and productive only where it is artificially watered from tanks or wells. This portion of the province is very bare of trees, and most of it is uncultivated; the crops also, where crops are raised, are of the least productive kind.

The portion south of the Jumnah is better watered; but great part of it is covered by jungles, and the population is but thinly scattered.

The Doab, also, is a naked country, and too dry, and with two light a soil, in most places, for the production of rice; but, with proper cultivation, it is well adapted for cotton, indigo, and sugar. Indeed the whole province answers better for cotton and indigo than any other crop. The province of Agra holds a sort of

middle place between the arid sterility of Ajmeer, and the extreme fertility of the Gangetic plain. Like Delhi, it was ruined during the century of desolation; and it appears to recover very slowly: some of the reasons will appear afterwards.

Oude.—Though small, compared with some other of the Indian provinces, Oude is a very valuable and delightful country. Delhi, Agra, and the great stream of the Ganges, intervene, and protect it from any deleterious influence of the desert; while in the hills, which separate it from Nepâl, and also the Himalaya beyond, furnish an abundance of rivers. Agra and Delhi bound Oude on the west; the Rohilcund district of Delhi bounds it on the north-west; the Nepâl hills stretch along the north-east; Bahar forms the boundary on the south-east; and Allahabad on the south. The extreme length, from near Allahabad, on the Ganges, to the north-east point, where the Gogra issues from between Nepâl and Kumaon, is not less than two hundred and fifty miles, and the extreme breadth is one hundred and fifty; but the northern part is very narrow. The Ganges and the Gogra (called also the Sarga and the Dewa,) are the largest rivers that water Oude; but between them there is a very beautifully-winding river, which belongs to the province,

or, at least, enters it, from the hills in the south-east of Rohilcund, only in a few detached rivulets. That river is the Goomty; and the name, which signifies "winding," is most descriptive of the course of the stream. This winding river, which traverses the whole length of the country, is, at all seasons of the year, navigable through a great part of the extent, while branches flow parallel to the main stream, and the whole plain (for Oude is one plain) is seamed with rivers.

Such a country, protected alike from burning and from chilling winds, sloping very gently to the south-east, having in general a fine bluish soil, consisting in a great measure of vegetable matter, and being every where within the reach of an unlimited supply of water, wants only cultivation—a very moderate degree of cultivation—to make it highly productive. Accordingly, when cultivated, Oude furnishes in abundance all the vegetable wealth of India: rice, wheat, barley, and all other grain, with a variety of fruits; and sugar-canes, opium (*papaver somniferum*), indigo, and all other articles of commerce that require a rich soil. The communication from this part of India to the Bay of Bengal, though long, is direct; and the only time that it is interrupted, or restricted to very small boats, is when the Ganges is very

low, and choked up by the temporary banks of sand; and as these occur most frequently in the very winding part of the river, between its confluence with the Jumnah and that with the Goomty, they do not affect the water intercourse with Oude so much as that with Agra and Delhi.

GUJERAT.—As that province has been, in part, described in the notice given of the shores, a very few words will suffice to complete the outline of its position.

The Gujerat province consists of the peninsula, between the Gulfs of Cutch and Cambay, with about as much of the country between the Nerbudda and the Rinn, as is equal to the half of that peninsula. The boundary toward the Nerbudda is the river Mhye, and Malwa lies on the opposite bank, while Ajmeer forms the boundary from the Mhye to the Rinn. The length from south-west to north-east is, therefore, about two hundred and fifty miles, and the greatest breadth about one hundred and fifty. A portion to the south of the Nerbudda has sometimes been described as included in the province of Gujerat; but that produces a confusion, as that river is the boundary between Hindûstan Proper and the Deccan.

Though none of the hills in Gujerat are high, and though, in a detached country of so limited

dimensions, none of the rivers can be large, yet it is both a picturesque and a well watered country. Everywhere there are fine clear streams, and the scenery is often very wild and striking; it abounds with sacred places, and remains of antiquity; and is one of the poetic portions of India.

MALWA.—The province of Malwa occupies the country immediately to the north of the Nerbudda, extending eastward to the sources of that river in the table land of Omerkuntuc. Gujerat and Ajmeer are its boundaries on the west, the river Mhye forming a natural line of separation from the former, and a ridge of hills from the latter; Ajmeer and Agra lie on the north; Allahabad on the east, Gundwana on the south-east, and Berar and Candeish on the south. The Vindhaya ridge, on the right bank of the Nerbudda, form the principal elevation of the province, and the general slope of the surface is from those mountains toward the north.

Malwa stretches across the upper parts of the Chumbul, the Sind, the Betwah and their branches; and is, upon the whole, a well watered country. Though the ridge along the south of the province of Malwa be hardly anywhere more than two thousand feet above the level of the sea, and though the descent south-

ward to the Nerbudda be in general steep, the character of a great part of the country on the other side is very different. The slope is so gentle that the whole has the appearance of a table land, over which a number of romantic conical hills are scattered, and along which a number of rivers have their courses. So little is the southern part of this table land different from the summits of the Vindhaya ridge, that there is no part of that ridge elevated one hundred feet above the commencement of it. Thus, with reference to Malwa, the range is a bank rather than a ridge of mountains; and seems as if, in the lapse of many ages, the Nerbudda had worn a passage for itself from one to another of a series of lakes, until the whole have been discharged.

The gradual slope of Malwa, its proximity to the Arabian sea, and its distance from the desert, with the diversification of its surface by the small hills that have been alluded to, all serve to point it out as a district which, if the fault is not in the soil, should be fertile. The soil, too, is of the most favourable kind, being a fine black mould, formed of decomposed trap (?) and vegetable matter,—a species of soil which is, in general, as celebrated for the quality as for the quantity of its cultivated produce. From the situation, the temperature is mild; and

there are instances of the thermometer being below freezing in the month of January.

The situation is rather too elevated for a great or general production of rice, but enough is raised for the supply of the inhabitants. Wheat, the larger Indian millet, maize, and all the leguminous plants that are usual in Indian husbandry, are cultivated with much advantage—more especially wheat, and the large vetch, called *gram* in the country, both of which are exported in great quantity. So great is the variety of agricultural produce, that it is difficult to name one species which is not cultivated in Malwa. Perhaps grapes and opium are among the most celebrated. The vines of Malwa are peculiarly productive, and the opium is considered as more pure than that of the valley of the Ganges. In the opium trade, however, the nature of the country affords very great facilities for smuggling.

ALLAHABAD.—The province of Allahabad occupies the country immediately to the north-east of Malwa; and it extends about two hundred and sixty miles from east to west, and one hundred and twenty from north to south. On the west it has Malwa and Agra; on the north Agra and Oude; on the east Bahar and Gundwana; and on the south Gundwana. Allahabad consists of two separate descriptions

of country: low plains, on the Ganges and other great rivers, in the north; and an elevated table land, toward Malwa and Gundwana, in the south and south-west.

The plain is intersected by many large rivers, the Jumnah, the Ganges, the Goomty, and many smaller ones—the Ganges winding very much within the province, and thus contributing to its fertility. This part of Allahabad is one of the richest and most productive in India; but it is exceedingly hot, and subject to the pestilent winds from the desert.

The table land in the south, though far from a barren country, is not nearly so productive as the plain, and the agriculture there has to be assisted from tanks and wells. Pannah, in the south-west part of this table land, at a short distance from the right bank of the river Cane, has long been celebrated for its diamond mines, those costly gems being often found of large size, and so pure, and free from roughness or opacity on the surface, that they hardly require to be cut or polished. As is the case with all places where diamonds are to be found, the surface around Pannah is sterile, and the soil containing the diamonds is gravel. This gravelly soil is more or less tinged with iron, and it varies in depth from three to twelve feet, that which is deepest being the richest in dia-

monds. The mines are not kept open or worked during the whole year; but filled up carefully before the rains, and opened again about a month after these are over. During the dry season, they remove and carefully examine the kuckroo, or gravel; and when the search is completed, they carefully return it into the same pits from which it was taken. The production of the diamond, considering that it has always been met with in gravel, and gravel apparently of the same description, and never embedded in rock, or with its crystals adhering to the nodules of pebbles in the gravel, is a very curious matter, and quite out of the way of common geological theory. The native miners, or searchers for diamonds, at Pannah, who, according to the general practice of the country, follow the occupation from father to son, all assert, with the utmost confidence, that the production of diamonds is constantly going on. The mere assertion would not be worth anything, but they add to it a sort of proof, and as that proof is a practical one, and involves their own interests, it is the more worthy of attention. They return the kuckroo, which they have searched with the greatest care, back into the mine, in order to produce more diamonds; and they add that, after it has lain undisturbed for fifteen or sixteen years, they

open it again with precisely the same chance of success, as if they opened a portion that had never before been touched.

There is no reason why they should misrepresent the facts, because they can have no inducement to do so; and if they did not find the fresh turning of the same gravel productive, of course they would let it alone.

This is a subject upon which it is impossible to come to any conclusion, because we know nothing of the process by which diamond is formed. We know, however, that it is pure carbon, or charcoal; that when burnt, it combines with oxygen, and a portion of pure carbonic acid, exactly equal in weight to the diamond and oxygen consumed, is the result. This being the case, we are quite sure that, if we could take a quantity of pure carbonic acid, and abstract from it all the oxygen that it contains, the remainder would be exactly the same substance as diamond; and as we know of no form under which carbon exists in nature, pure and unmixed with any other substance, but that of diamond, analogy would lead us to suppose that, if we could but abstract the oxygen from pure carbonic acid, the result would be diamond itself, in all its hardness and brilliancy.

Now the colouring matter that is found in all diamond gravels is an oxide of some sort

or other; it contains oxygen, and, therefore, the metal, or metal and alkali united, that enters into this oxyd, may derive its oxygen from the decomposition of carbonic acid gas; and by mutual attraction the atoms of pure carbon may be crystallized into diamond. This is only conjecture, however; but those who have access to the gravel might make experiments.

At all events, though, in the time of the Emperor Acbar, the diamond mines were worked to the extent of one hundred thousand pounds sterling in value annually, they are not exhausted: for in 1820, Captain Bulkley of the Bengal establishment, mined on a small scale, and obtained diamonds to the value of two thousand rupees, with a profit of more than cent. per cent. on the expense of seeking for them.

Bahar.—The province of Bahar, lies across the whole valley of the Ganges, between the table land of Omerkuntuc and the hills of Nepâl. Taking Bahar in its widest extent, it is bounded on the west by Gundwana, Allahabad, and Oude; on the north by the Nepâl hills; on the east by Bengal; and on the south by Orissa and Gundwana. It is a large province, being, at least, two hundred and fifty miles long, and two hundred broad, and the Ganges winds through it, generally in an east-

erly direction, for a length of two hundred miles. Throughout the whole of Bahar the Ganges has a breadth of about a mile; and though both nature and art combine to flood great part of the surface, during the rainy season, the banks of the river are high, and there is very little of the surface in a state of continual marsh. The greater part of Bahar is a plain, and a plain of great natural fertility, and in a high state of cultivation. It has, from time immemorial, been the garden of the Valley of the Ganges; has been in general thronged with people, and in a high state of productiveness; while the soil is naturally more dry, and the climate, in consequence, more healthy, than in some other places. Every species of grain, but particularly those that are adapted to dry culture, with sugar, indigo, oil seeds, roses, and other flowers, from which the sweetest perfumes are extracted, grow upon the plain of Bahar; with every description of the fruits of the East, the mangosteen and the durion excepted.

Besides the exuberant productions of its soil, of which the opium alone would make it wealthy, Bahar exports a great deal of saltpetre or nitrate of potass. The causes that induce this valuable production in the soil of the Valley of the Ganges, have been already hinted at. Those causes are augmented in

Bahar by the quantity of lime that is mixed with the soil, as well as by the hot winds, which, during the warm season of the year, blow from the west. These winds of course promote the decomposition of the vegetable matter, which affords the potass, and of the animal matter and the atmospheric air which supply the nitrogen and the oxygen. Indeed it appears that these winds are necessary for the spontaneous production of nitre in the soil; and that, where they do not extend, it cannot be produced except in artificial beds, containing a greater quantity of animal and vegetable matter. Of course, since the desert, which is the source of those winds, crept eastward, nearer to the Jumnah, and dried up the rivers in the west of Agra and the east of Ajmeer, the winds have advanced in the same direction and ratio in their course. They are now, in consequence, felt not only more powerfully toward the east of Bahar, than they were in former times, but have reached Bengal, in which they were once unknown; and nitrate of soda has begun to be formed, and to be an article of attraction and commerce there.

There is a portion of the south-west and south of Bahar, which is not so very productive as the extensive plain to which allusion has been made. That is the portion lying to

the eastward of the Sone, and southward to the confines of Gundwana and Orissa. It was previously mentioned that, in consequence of the value of the country through which it flows, and the violence of its current when swollen, the Sone brings down, and deposits in the lower part of its channel, an immense quantity of sand. That sand is acted upon by the dry and parching west winds, which whirl it into heaps on the bank of the river; and these heaps are spreading their own sterility over a portion of the country.

Independently of that, there is, at a very considerable distance from the Ganges, a ridge of hills, nearly parallel to the general bed of that river, though about sixty miles to the southward of it. Those hills, like the hills in the south part of the Peninsula, are called the Ghauts, because there are through them Ghauts, or passages, to an upland country, that borders upon, and partially occupies, the table land of Omerkuntuc. That elevated land is, of course, not nearly so productive as the plain, and the cultivation demands the aid of tanks and wells, as is the case in the other dry parts of India. It is healthy, however, and though nothing compared to the plain, far from an unproductive country. Taking all its districts together, there are few spots on the globe, where so many

people can live on an equal extent, and have so much and so valuable spare produce.

BENGAL.—This is the best, the largest, and, from its vicinity to the sea, and being the place through which communication with the others is chiefly made, the most important province of India. The territorial boundaries of Bengal are, Bahar on the west; Nepâl, Sikkim, and Bootan, on the north; Assam and the Burmese territories on the east; the Bay of Bengal on the south; and Orissa on the south-west. The whole length from north to south is about three hundred and fifty to four hundred miles, and the average breadth not less than three hundred. It is enclosed on many parts by natural boundaries, which are nearly impassable; and would of itself constitute a large, rich, and powerful state. The whole of the north side, from Assam westward, is fenced in by a vegetable wall, of the most formidable character, and which is a far better defence, should a defence in that quarter be necessary, than the wall of China, or any other rampart thrown up by human art; and even there it has this advantage, that it is reared without labour, and contains in itself the principle of its own repair and continuance. This natural rampart consists of a belt, of moist and extremely fertile alluvial land, formed by the debris of the

northern mountains: and the humidity of those mountains, which is retained and gradually given out by the soil in perpetual springs, keeps the powers of vegetation in great and incessant action. The consequence is, a degree of productiveness of which there is hardly anywhere a similar example. Trees, of the largest dimensions, and land together with climbing plants, extend over the whole. But, with all their size and vigour, they are not able to exhaust the powers of the soil and the climate, for the very grass which springs up between them, and which is more thickly sowed than wheat on the richest field in England, emulates a forest. This formidable plant, to which the natives give the name of *augeah* grass, rises to the height of thirty feet, with a stem nearly three inches in diameter, and is hardly permeable by the impenetrable hides and heavy masses of the elephant and rhinoceros, and, therefore, a complete barrier against human beings. On the east, now that the boundary has been extended to the mountains of Cachar, approach is equally difficult, and, considering the length of coast toward the south that is in the British possession, and the nature of the country through which an enemy would have to come in that direction, it would be next to a miracle, if a hundred out of every thousand

that might be disembarked and marched overland for that purpose, could reach the plain of Bengal. On the south, the country is almost equally inaccessible. Through the jungles of the Sunderbunds no human being could penetrate, even though there were no tiger crouching in the thick foliage, and ready to spring; there is no channel for vessels but the Hoogly, and only those who are familiar with it, can conduct a vessel safely through that long and difficult navigation. The Ganges, too, separates the one half of the province from the other; and thus, come danger whence it may, it could fall upon only half the province at a time.

Bengal probably got its name from the great extent of it that is flooded during the inundations,—*beng*, in the language of the country, signifying a flooded land. The whole province is flat, and, generally speaking, fertile; and all the flooded lands produce vast crops of rice. But the greater part of the soil is a very soft alluvion, in which the rivers are continually shifting their channels; and there are many *jeels*, or deep morasses, which, in the dry and warm season, tend to render the air unwholesome. From the heat of the air, and the humidity of the surface, the climate of Bengal is moist in the extreme; and, even in the dry season, the dews fall so

heavy as to be unwholesome. The substratum of soil, in the lower part of Bengal, is sand; but that sand is so completely cemented with the fine mud which the waters deposit, as they stagnate during the rains, that it becomes impervious; and, though the surface be remarkably humid when the rivers are swollen, water is not met with in the soil but in small quantity, and at a great depth below the surface.

Though there are morasses, and also sandy tracts, of a considerable extent, in Bengal, the province may be regarded as extremely fertile. Grain, also plants and fruits, are extensively cultivated, although the fruits are inferior to those of many other parts of the country. The population of Bengal is very great; and though the food of the great body of the people be small and simple, as regards the individual, and the land abundantly productive, the crops sometimes fail, and all the horrors of famine are experienced.

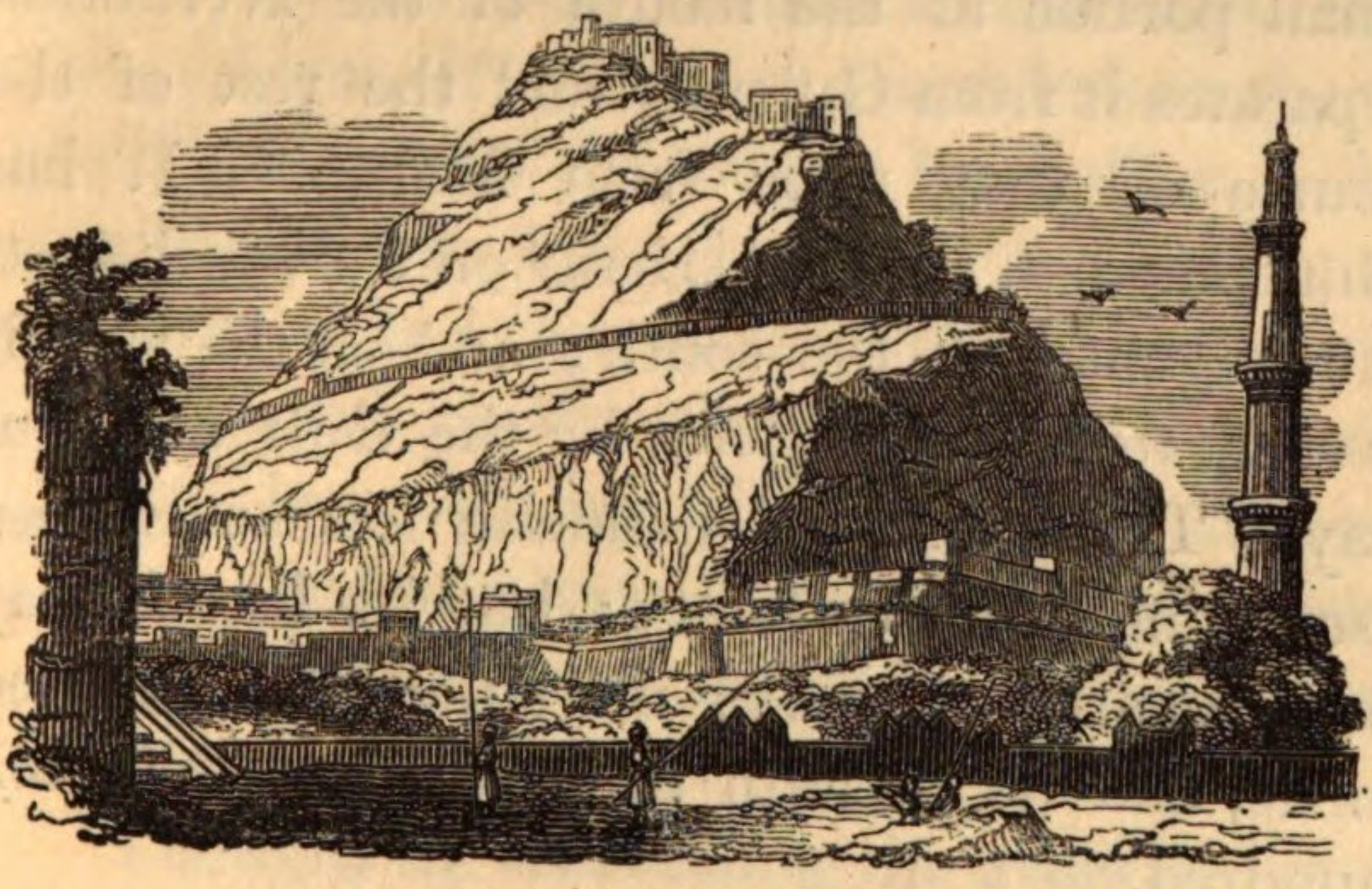
Bengal has a decided advantage over all the other provinces in the valley of the Ganges, in being upon the sea coast, and also in having a greater proportion of the seasonal rain than any of the others. It has the share that falls directly upon the surface, and also the use of that which the Ganges, the Brahmapootra, and the other rivers bring from the upper coun-

tries. So that it is more easily reached by sea, and also less exposed to contingencies, than the other provinces.

Such are the provinces of India Proper. In noticing their positions, we have studiously avoided all allusion to the towns, the people, or the manufactures, because these can be glanced at more effectively in a future chapter, when all that relates chiefly to the country is before us.

CHAPTER VII.

PROVINCES IN THE DECCAN.



HILL FORT OF DOWLATABAD.

THE provinces in the Deccan, between the Nerbudda and the Krishna, like those of the other parts of India, have little or no reference to the territorial division; and thus their prin-

cipal use, in a geographical point of view, consists in dividing the description into portions, which are more easily understood, than if the whole of so large a region was to be treated of at once. The most modern division of the Deccan provinces, and therefore the one most convenient for the purpose of decription, is the following:—Candeish, Gundwana, Orissa, the Northern Circars, Berar, Aurungabad, Beedar, Hyderabad, and Bejapoor.

CANDEISH.—This is the first province upon entering the Deccan on the north-west, where a small portion at the mouth of the Nerbudda separates it from Gujerat, and the rest of the course of that river from Malwa. It has Gundwana on the east, Berar on the south-east, Aurungabad on the south; and on the west it is separated from Gujerat by the Gulf of Cambay. The extent of Candeish has never been ascertained with certainty; but its length may be estimated at rather more than two hundred miles, and its breadth at rather less than one hundred.

Though Candeish was much spoiled during the wars and contests of the native princes, and though even now it has but partially recovered, the very ruins show the fertile nature of the country, which is, at the same time, very picturesque and beautiful.

Several chains of low hills intersect the country, of which the most considerable are the Santpoora range, between the Nerbudda and Tuptee, and the parallel ridge, which separates the course of the southern branches of the Tuptee from those of the Godavery. The summits of those ranges, as well as some detached summits throughout the country, are barren; and there are many parts of the slopes and valleys overrun by jungles; but still a very considerable portion of the province is fertile. Throughout great part of its extent it is traversed by fine clear rivulets and streams, which are seldom, if ever, dry; and before the ruin and desolation of the country by Holkar, in 1802 and 1803, the hills contained a great number of streams and reservoirs for the irrigation of the valleys and plains, when the water is deficient. These, however, are in ruins, as well as the villages; the latter were deserted; all were covered with wild vegetation, and the place was infested by tigers.

Though, in considering the general divisions of India, the whole of the western portion, south of the Nerbudda, may be considered as included in the Deccan, yet the district of Surat, on the Tuptee, is regarded as a portion of Gujerat. This portion, though a good deal neglected, is very productive of cotton, of which a great deal

is exported in the unmanufactured state. The upper country—the plain, or rather the valley of Candeish (for it chiefly consists of the countries which slope south and north to the Tuptee, and which is separated from the Surat district by a thick and extensive jungle), is also well suited for the same kind of produce. The jungles of Candeish are very unhealthy; and even those parts which are cleared are said not to be so salubrious as, from their comparatively elevated situation, one would be led to expect. The population of this part of India is very small, in proportion to the surface, compared with that of Bengal and Bahar; and the number of people to the square mile is not nearly so great as in some parts of Europe.

GUNDWANA.—That large province may be accounted one of the wildest and least known parts of India. It receives its name from the people styled the Gunds, or Gonds; but its population consists of a great number of tribes; and the Gunds chiefly inhabit the south-eastern parts. Gundwana is very large, being about five hundred miles in length, and nearly three hundred in breadth; but, as it is not very well known, and as the countries immediately bordering upon it partake a good deal of its wild, woody, and impenetrable character, its boundaries are not very accurately ascertained. Its

length, from north to south, ranges over about 6° of latitude, or from 19° to 25°. The boundaries on the west, commencing at the southern extremity are, successively, Hyderabad, Berar, Candeish, Malwa, and Allahabad; those on the north are Allahabad and Bahar; on the east there are Bahar, Bengal, and Orissa; and on the south-east and south, the Circars and Hyderabad.

This country, in the present state at least, is not of value proportionate to its extent; neither is it sufficiently known for allowing any thing like an accurate general description of it to be given. It is, altogether, an elevated country, though the elevation is nowhere very great; but it is, at the same time, uneven, consisting in some places of hard gravel, upon which there are few or no trees and but little vegetation of any kind; in other places, there are columnar heights of trap-rock, the intervals between which have a comparatively rich soil, and abound with fine timber in some places, and vast thickets of bamboos. In the upper part of this district, where most of the rivers have their sources, there are many swamps and pools, and in some few instances advantage has been taken of the latter to form artificial tanks for the watering of the land in the dry season; but the cultivated land consists of only a few patches

scattered through the wilds and forests of this extensive region. The principal rivers are the Mahanuddy and the Wyne Gunga, branches of the Godavery, between which latter, Nagpoor, the reputed capital of the province, is situated. The land in that quarter is a little better cultivated, and the people are not so completely in a state of nature as they are in the forests and jungles, which are understood to be inhabited by some tribes who held the same situation anterior to the settlement of the Hindûs in India.

Orissa is a long and narrow province, lying on the east, or rather the south-east, of Gundwana, bordering with Bengal on the north, and the Circars, to the Chalka lake, or marsh, on the south of the river Mahanuddy, but extending, indefinitely, to the south-west, upon the mountainous tract, within the Circars, till it be confounded with the forests and wilds of the Gonds, nearly as far south as the Godavery. Bengal forms the eastern boundary. As from the Circars northward the Bay of the interior of this province is rude, and has been but little explored, the dimensions cannot be very accurately stated. Probably the length is rather more than five hundred miles, and the breadth less than one hundred. The western part of Orissa is, throughout the whole of its

length, so wild as to be almost impassable, and even impenetrable. The hills are rugged, the woods and jungles thick and impenetrable, and the water-courses rough and interrupted, and in the rainy season full of foaming torrents; while, to Europeans, the air is peculiarly pestilent. Even the few natives who, in the dry season, go from the coast to the interior, find the passage neither pleasant nor wholesome. This district, above the Ghauts, or mountain-passes of Orissa, and the Circars, forms a boundary through which no army could pass from the confines of Bahar to the banks of the Godavery; and therefore it forms a complete protection to the inland country against the coast, as well as to the coast against the inland country. Toward the north, the inland country is a little better, some valleys among the hills being cleared and cultivated, and the hills themselves containing iron mines of some value; but even there, the valuable part of the surface bears but a small proportion to the whole.

A very considerable portion of the shore of Orissa consists of salt marshes, which are flooded during the rains, but from which a very considerable quantity of salt is manufactured in the dry season. It need hardly be mentioned that this part of the province is unhealthy. This reaches inland for about twenty miles,

and then there is a hill of dry land, which produces rice and other vegetables. That is nearly of the same breadth as the swamp along the shore; and behind are the woods, which, in addition to the disadvantages already mentioned, are very much infested by leopards and other beasts of prey.

The CIRCARS occupy the remainder of the eastern shore of the Deccan to the Chalka lake southward, and, indeed, extends several miles to the south of the Krishna, where they join the Carnatic. The whole length is not much short of five hundred miles; but the breadth is inconsiderable; and there is a sandy waste almost the whole way along the shore. Within this, however, there are many valuable districts of cultivated and productive country, more especially toward the Godavery and the Elyuram, which flows from the hills parallel to the lower part of that river, at about thirty miles to the north, and which, though but a small stream, contains all the year round abundance of water for the purposes of irrigation. That part of the Circars which lies near the mouth of the Godavery and Krishna, is, indeed, not only the most fertile on the whole western shore of the Bay of Bengal, but the most fertile in the Deccan. The lower lands are remarkably well suited for the growth of the sugar-

cane, and those which are situated a little higher are equally well adapted for that of cotton. As was mentioned already, this fertile part of the coast of the Circars has a much more accessible beach, and is less exposed to the violence of the surf, than any other along the same side of the peninsula. Both the fertile country, and the approachable portion of the shore in the Circars are, however, but small in proportion to the whole.

Berar.—This province is an elevated valley, occupying nearly the centre of the Deccan. It has Aurungabad and Candeish on the west; Candeish and Mulwa on the north; Gundwana on the east; and Beedar and Aurungabad on the south. As is the case with the other provinces in this part of India, the limits of Berar are not very well defined; and different writers give different accounts of them. The chief cause appears to have been an attempt to give the permanence of geographical division to the perpetually shifting territorial distribution,—an attempt which, during the time when the Maharattas had the command of the country especially, was nearly as vain as it would be to attempt describing a particular landscape, from the form and position of the clouds, and the distribution of the lights and shadows, on any particular day.

Berar consists of several valleys, though the

entrances to it from the surrounding countries are generally through ghauts, or passes, in ridges of hills, more or less covered with wood and jungle. Those valleys principally are, the upper part of the valley of the Tuptee in the north, that of the Pyne Gonga in the south, and half of that of the Wurda in the south-east. The valleys of Berar have, in general, a rich and fertile soil, and when allowed to run into a state of nature, produce very fine grass. The cultivated tracts are, in general, rather too much elevated for rice; but they produce very fine wheat, leguminous vegetables, and flax. Sometimes the rains fail, and the country suffers all the horrors of famine.

AURUNGABAD.—That province occupies the west coast, and a portion of the country to the east of the Western Ghauts. It has the Surat district of the Gujerat, Candeish, and Berar on the north; Berar and Hyderabad on the east; Beedar and Bejapoor on the south; and the Arabian sea on the west. It may be estimated at about three hundred miles in length, and one hundred and fifty in breadth.

The surface of this province is very elevated, the general level being not much less than two thousand feet above the level of the sea, and some of the summits are considerably more. Summits of a very singular shape often rise insulated; and were it not for their magnitude

they might almost be mistaken for works of art. One of the most remarkable of these is the fortress of Dowlatabad, about seven miles north-west of Aurungabad, the capital of the province. This fort is a mass of granite, standing more than a mile and a half from the hills, and rising to an elevation of at least five hundred feet, the lower part being a scarped and nearly perpendicular cliff, to the height of about one hundred and eighty feet, surrounded by a deep ditch, across which there is only one passage, and that admits no more than two persons abreast. The entrance to the fort itself is still more difficult. The first passage is a hole cut in the mass of the rock, which can be entered by only one person at a time, and that person must stoop. This soon leads to the first place of arms, which is a vaulted hall, excavated out of the rock, and can be illuminated only by torches. From this hall a passage winds upwards, about twelve feet in height and width, but still excavated out of the solid rock, and with a regular ascent. In the course of this passage there are several sallyports, consisting of trap-doors and narrow flights of steps, which extend down to the water in the ditch. The length of this approach is at least two hundred yards; and it terminates by an abrupt entrance into a second place of arms, hollowed

out of the rock, and about twenty feet square. This place of arms is protected by a peculiar defence—a great plate of iron, which covers the entrance, and upon which, in cases of emergency, a fire might be lighted, and which, as the plate is perforated and the draught of air the whole length of the passage below, would very soon become heated to redness. This place of arms is near the top of the scarped face of the rock, from which the ascent is still rugged; and the rock in many parts covered with bushes, and containing reservoirs of water,—so that, if properly defended, and very few troops would be necessary for that purpose, the fort of Dowlatabad could be won only by the actual starvation of those upon it; but it has this disadvantage, that very few could invest it, and the garrison could not, from the intricacy of the outlet, make an effective sally. There is one large gun upon this fort, a brass twenty-four pounder, at the summit, where the flag of the Nizam of Hyderabad, whose property in the meantime it is, is displayed. There are few other cannon upon it; and, indeed, artillery would not be very effective in such a place, the strength being in the rock itself.

Though the surface of the province of Dowlatabad, be elevated and irregular, it is fertile, and the scenery is often very beautiful. The

banks of the rivers are very productive of rice; and the slopes yield the other productions of India. European fruits thrive uncommonly well in the gardens. Strawberries and peaches are of the finest quality, and so are grapes, of which a large sort is extensively cultivated. Melons abound every where; and they are equal in flavour to the very best that can be raised by artificial heat in England. The country is, however, but thinly peopled, and any city or building that can be designated as splendid, is in ruins.

BEEDAR.—This province lies on the south-east of that of Aurungabad. It is about one hundred and forty miles in length, and seventy in breadth. Its boundaries are Bejapoor and Aurungabad on the west; Aurungabad and Berar on the north; Gundwana and Hyderabad on the east; and Hyderabad on the south. The rivers in this province are much larger than those in Aurungabad; but none of them are navigable; the Godavery and its branch, the Manjera, the latter of which winds a great deal, are the principal ones. It is represented as being a very fertile country; but the recent state of it is not much known. Since the year 1717, it has belonged entirely to the Nizam of Hyderabad, though until lately subject to a heavy tribute to the Maharattas; and as the

Nizam has generally been the ally of the British, ever since they acquired an influence in the Deccan, a British army, the usual means of geographical discovery in India, has not swept over the valleys of Beedar.

HYDERABAD.—Hyderabad occupies a table land of considerable elevation, between the Godavery and Krishna, to both of which rivers it extends. It has Aurungabad and Beedar on the west, and Gundwana on the east. The most remarkable natural feature of Hyderabad is the want of rivers, except those that have been mentioned as forming the boundaries, and they are too rocky and interrupted for being of any use in navigation. Those that rise in the province are seasonal torrents rather than rivers, as, unless when they are swollen by the seasonal rains, the water bears a very small proportion to the channel. The soil is, however, said to be fertile, though much of it be in a state of neglect and ruin; and the proofs of its former population and productiveness are found in the remains of villages and tanks, now hid in extensive jungles. The climate is temperate,—and, for India, even cold, as, during three months of the winter, the thermometer often descends to within a few degrees of the freezing point. Such a temperature, and the general elevation of the country, with the want of flooding, dis-

qualify it for the production of rice; but the wheat is excellent, and, with proper cultivation, might be abundant; and European fruits might be produced with much advantage. The most dreary district of the country is that which stretches from the city of Hyderabad southward to the Krishna; and yet it is there that the vestiges of a former population are the most numerous.

The Golconda district of the table land of Hyderabad has been much famed in Europe by poets, and also those writers who rear the fabric of their prose upon poetical foundations, as the place above all others where diamonds are found. But it so happens, that there is not a single diamond mine in the table land of the province of Hyderabad, nor is it likely that there ever was one found in the whole country between the Godavery and the Krishna, unless somebody had previously lost it there. The rocks in that part of India are granite or sienite, which never contain any diamonds. But the strong fort of Golconda was once the principal depository and mart of diamonds in southern India; though it had no more claim to their production, than the small island of Macao, in the Canton river, has to the production of all the teas that are shipped there for England.

BEJAPOOR.—This is a large province, occupying the south-west of the Deccan, and extending from the shore of the Arabian sea, eastward, to nearly the centre of the peninsula. Its boundaries are for the most part natural, and therefore more defined than those of the other provinces in the Deccan. The Beemah separates it from Aurungabad and Hyderabad, on the north and north-east, for almost its whole length, from the Western Ghauts whence it issues to its junction with the Krishna. While the Toombudra branch of the Krishna, and its western branch the Wurda, form as definite a boundary along the whole of the south-east side, to the summit of the Ghauts. On the small portion between the summits of the Ghauts and the Arabian sea, it is bounded by the coast district of Canara, while its north boundary on the coast is Concan.

The western part of Bejapoor is remarkably hilly; and abounds with insulated rock forts (called *droogs* in the south of India) similar to that at Dowlatabad. They are in general, however, more flat on the top, with the sides perpendicular for above one hundred feet; and in many cases, little art has been requisite in giving them that form. Those insulated rocks are common along the whole of the west coast of India from Ajmeer southward, and form

one of its chief natural features; but they are more numerous in Bejapoor than in any other province.

The Krishna is the chief river in Bejapoor, and the province naturally consists of the valley of that river, and one side of each of those of the Beemah and Toombudra. The greater part of the land is, however, high; the rivers are not navigable; and though the black soil upon the flats near the rivers be very fertile, these form but a small portion of the whole surface. Like Aurungabad, this province is subject to occasional famines and epidemic diseases, and indeed the whole line of high country to the eastward of the Western Ghauts is much less healthy than, from its elevation and its vicinity to the sea, one would be apt to suppose. There is a reason, however, which will appear, without much labour of detail, when we come to consider the causes that affect the climate and seasons in India.

PROVINCES SOUTH OF THE KRISHNA.

As the Krishna, with its branches, the Toombudra and the Wurda, form a complete line, reaching from the eastern sea to nearly the shore of the western, they form a very clear, and therefore, convenient division between the Deccan

and the south of India. The line is, however, taken along the Krishna direct, and thus the division includes the southern part of the province of Bejapoor, which, indeed, partakes much of the character of the country farther to the south, though separated from it by the courses of the Toombudra and Wurda

The length of this part of India along the west coast, which is its largest side, is about six hundred miles, and the greatest breadth is more than five hundred. Its most striking character is the great difference of elevation between the coasts and the interior, and the wild and rapid transition from the one to the other. The surface of the table land, or Balaghaut, is diversified with hills, valleys, and plains; but the greater part of it is about one mile above the level of the sea, and hardly any part of it has a less elevation than three thousand feet. The shores on the other hand are low; and from the quantity of shells, and shell lime, contained on the east-coast, one would be led to conclude that that had been formed by the joint action of the sea and the seasonal rains bringing down the debris of the high land. The divisions, exclusive of the south part of Bejapoor, or the district between the Krishna and Toombudra, are the Carnatic, below the Ghauts on the eastern or Coromandel coast, and extend-

ing the whole way from the south frontier of the Circars to Cape Comorin; the principalities of Travancore and Cochin, and the districts of Malabar and Canara, below the Ghauts, or rather occupying the slopes of the Ghauts toward the west, toward the Indian Ocean; and the Balaghaut and Mysore occupying the table land.

CARNATIC.—That province has obtained the name of the antient Hindû Kingdom on the table land, of which, however, it never formed a part. From the bank of the small river Gundigama, in the north, by which it is separated from the Circars, to Cape Comorin in the south, it has an extent of about five hundred and fifty miles; but the breadth is small in proportion. It varies much, but is, upon the average, not more than ninety miles.

The vast extent in latitude of the Carnatic, as compared with its breadth, requires a subdivision, independently of the names of the states, which are of very little consequence while the British power continues to predominate over the whole region. Those divisions are northern, central, and southern Carnatic.

The northern division extends from the Gundegama to the Pennar, and is by much the smallest of the three, not having above sixty miles of sea-coast. The central extends from

the mouth of the Pennar to that of the Coleroon, or northern branch of the Cavery, and has more than two hundred miles of sea-coast; and the southern extends from the Coleroon to Cape Comorin. The northern part of the Carnatic is the narrowest, and also that in which the mountains are most nearly in a straight line parallel to the coast; but the low and high lands have every where a definite boundary.

The position of the Carnatic is thus peculiar, being low and narrow, and having the sea on the one hand, and an abrupt ridge of mountains on the other. The atmosphere is, therefore, in a great degree, confined to itself; and both from that and from the nature of the soil, it is exceedingly hot. It has been already mentioned, that the soil of this district is a mixture of debris from the land and marine remains. The debris is not, however, like that which is met with in the valleys of rivers, for the country is not a river formation, if we except, perhaps, a portion adjoining the Cavery. All the rivers rise in the mountains; the larger ones have the principal part of their courses there, and they merely cross the Carnatic to the sea; and instead of receiving any addition in the country, they are diminished by evaporation as they run. In the rainy season, indeed, they do receive water there; but

it is a deluging flood, which washes the more valuable part of the soil into the rivers, and thence into the sea, where the reaction of the tide mingles it, with the sand, upon the beach. The only thing from which a debris can be formed in the Carnatic is, therefore, the rock itself. That rock is a sienite, containing less than the ordinary proportion of feldspar, and, therefore more oxide of iron, and less potass. The ruins of rocks and hills, of this species of stone, are found in every stage of disintegration and decomposition, from fragments that can be crumbled into pieces, indefinitely small, by the hand, to ordinary sand. In the more favoured places, this is mixed with a little decayed vegetable matter, and forms a sort of loam; and in those that are less so, it is mere sand.

A soil of this kind cannot retain humidity, and, therefore, there are no springs in the low country of the Carnatic, nor till an elevation be reached, where the undecomposed rock is high enough above the surface for discharging the water that sinks into the porous soil. Water may be obtained by digging; but unless the depth be considerable, it is small in quantity, and impregnated with salt. Salt abounds, indeed, in all the part that lies near to the sea; and when the surface dries, after the rains, it is covered with a saline efflorescence. This

impregnation extends as far as the shells and other marine remains are found, and marks the tract which may have once been covered with the sea. Within this, the soil is not so saline; but it is almost equally sterile,—the chief difference being that it is more favourable to the growth of trees.

Thus the only element of fertility naturally found in the Carnatic is heat, and that, in the absence of the others, produces an opposite effect.

Still, from the rivers, with which it in all places abounds, the Carnatic must have been a populous country for a long period; although those rivers chronicle upon their crumbling parts, the effect of the same causes by which the mountains have been disintegrated. But the vicinity of the Ghauts has its use even here: the rivers all descend from those mountains with considerable rapidity; or they may be reached at such an elevation as that the water can be conveyed by canals over the neighbouring districts. Large tanks are also formed by building dams across the hollows; and where such hollows are not convenient, tanks, lined with masonry, are constructed. By the aid of these all the hollows are brought into culture; and that which, left to itself, would be a desert, or produce only hard, prickly, and saline plants,

of no value, is made to yield crops. The lowest lands, which are near the great rivers, and can have an unlimited supply of water, are planted with rice; the smaller species of grain are sown in the drier soils; and those that are more arid still, are planted with the dwarf cotton tree.

The chief rivers that belong to the Carnatic, that is, which rise in the mountains on that side, and have not any part of their courses over the plains of the table land, are the Palaur, which falls into the sea, about forty-five miles to the south of Madras; the Punair, further to the south, which enters the sea near Pondicherry; and the Vaygaroo, which enters the strait between the south-east coast and the island of Ceylon. The former two have courses about two hundred miles long; and contain much water during the rains: but are nearly dry before these commence: the latter is so taken up for the purposes of irrigation, that hardly any portion of its waters reach the sea, except in seasons when the floods are unusually great. To those who live in climates which water their fields for them, and who are not always sensible of the labour that they are thereby spared, the number of tanks and water-courses that are required in the Carnatic, would appear almost incredible. In the district of

North Arcot alone, and it (the low country between the Pennar and the Palaur) is not a large one, there were, in 1810, about four thousand tanks, and more than twenty thousand artificial water courses.

Though the coast continues sandy and sterile, along the whole distance to Cape Comorin; and though, in the Tinnavelly district, immediately to the east of the Cape, there be a succession of sand hills along the shores, with very offensive salt marshes behind them, some parts of the Tinnavelly district are fertile. In the south-western part of that district, the high land is reduced to a single ridge of mountains, of which the descent to the plain is much more gradual than in the Central Carnatic about Madras.

The country on the east side of the mountains toward Cape Comorin, is peculiar both in its climate and its scenery. The former is mild, and, to Europeans, exceedingly agreeable; and the latter is highly picturesque and beautiful. Two fine little rivers, the Tamharapurni and the Sylaur, rise in elevated valleys among the mountains, at the heads of which, there are narrow passes into the adjoining district of Travancore. The elevated valley through which the Sylaur runs, is twenty miles long, and it has sometimes been styled "the happy valley of Courtallum." The tem-

perature is, at all seasons, ten degrees lower than toward the sea; and as there are none of those arid vapours, which, as they decompose sienite and corrode marble, cannot be very wholesome for human beings, that are found along the coast. From its action on metals, there is little doubt that the air over those salt sands and marshes contains a good deal of muriatic acid gas, more especially during the excessive drought, and from that the mountain valleys are free. Even during the rains, there is not that powerful sensation of damp which is found on the coast; and, indeed, the action of a verdant surface differs far less in rain and dry weather than that of naked sand, more especially one of sand impregnated with saline matters, where many causes combine to decompose the water, and otherwise alter the temperature.

The ordinary productions of this district of the Carnatic are rice and cotton; but cinnamon, nutmeg, and coffee, have also been introduced, and appear to answer very well; though they are not, perhaps, quite equal to the produce of those places where the plants are native.

TRAVANCORE.—The instant that Cape Comorin is doubled toward the west, the appearance of the coast and the country undergoes a remarkable change for the better. There is

no more a long dull line of beach, with the eternal roll and roar of its surf; no more a soil of rotting rocks and saline impregnations; no more an atmosphere caustic with muriatic gas; no more the beds of the rivers appearing like the highways of England during a hot and dry summer; no more plains of thirsty sand, and mountains formed of naked and crumbling rock; all is fresh, and green, and smiling, and fragrant. The mountains are crowned with forests, producing spices and aromatic gums. The woods in the hollows abound with elephants, tigers, and buffaloes; and they swarm with apes and monkeys, many of which congregate in herds made up of smaller divisions. The open part of the country is finely diversified with hill and dale; and water is so abundant at all seasons, that there is no need of tanks and artificial courses.

Travancore is the southmost portion of this delightful country, and probably among the best parts of it; and there are few districts, of the same extent, that have so many natural advantages combined. It is, however, a very small country, being only about one hundred and forty miles in length, and forty on an average from the mountains to the sea. The dry and wet cultivation are pursued with equal advantage upon the soils that are adapted to them.

Cochin.—The name of this district, which,

like Cutch, signifies *a morass*, is derived from the nature of the coast, the greater part of which, is occupied by small islands, sand-banks, lagoons, and salt marshes. But the country within these is fertile, and, in all its peculiarities and productions, very much resembles Travancore.

MALABAR.—In the British province of Malabar, the character of the country changes a little; and narrow as the district is, from the summit of the Ghauts to the sea, there are three distinct kinds of soil—the coast, the hills, and the slope of the Ghauts.

The coast, which extends, in all, about two hundred miles from south to north, consists of a sandy and barren margin, very much broken by lagoons and inlets of the sea, but having in general a width of about three miles. In most places this sandy soil rises into hillocks or downs; and the inner ones are remarkably productive in cocoa palms.

The second district consists of low hills, of which the tops are in general flat, the sides rather steep, and the valleys by which they are separated are deep and narrow. Small streams, of which the courses are in general very short, run through these deep valleys, from the Ghauts. At some places these fall into the inlets; but the course of others is

interrupted by the sandy shores, and, during the rain, they are thus dammed up, and flood all the lower parts of the valleys. The bottoms of the valleys, among those low hills, are remarkably fertile, and so are some of the slopes, which are cultivated in terraces, after the Chinese method. Rice is the principal produce of the low and flooded lands, and two or sometimes three crops are obtained in the year; but the crops are not nearly so heavy as in many parts of India, as the soil though sharp, and fertile, contains too much sand for being strong or rich. On the drier parts pepper is cultivated to a great extent; and though the productions be very varied, rice, cocoa-nuts, and pepper, may be considered as the prevailing ones.

The slopes of the Ghauts are of a bolder character; and are chiefly valuable for their forests,—the teak of Malabar being of peculiar excellence.

CANARA lies to the north of Malabar, and is the last division of the west coast of India, south of the Krishna. It is bounded on the north, toward the sea, by the small decayed Portuguese settlement of Goa, and beyond that by the province of Bejapoor. The mountains and Malabar form its other land boundaries; and the sea washes its shore for about one

hundred and eighty miles. The surface of Canara is much more rugged and uneven than that of Malabar, and, consequently, the quantity under cultivation and the produce are much smaller, in proportion to the whole extent of the country. The articles produced are, however, nearly the same. The surface is so very uneven, and so many new ravines and gullies are formed by the rains of every season, that intercourse, and especially the carriage of any weighty article, is very difficult; and on that account, Canara can never become a country where the labours of an abundant population can find an adequate reward.—Such are the outlines of the countries that lie between the table land of Southern India and the adjoining seas; let us now glance at those by which the table land itself is occupied.

BALAGHAUT.—Though that name be descriptive of the whole country above the passes of the mountains, it is generally applied only to that which occupies the northern portion. This portion extends across the whole country, from the eastern to the western Ghauts, having the Krishna and the Toombudra on the north, and the Mysore country on the south.

The southern boundaries of this part of India are so irregular, that it is not easy either to state its form or find its dimensions; but it

is at least equal to a rectangle, two hundred miles long and one hundred broad. The general slope is toward the north, though there are mountains on some parts of that frontier, toward the bank of the Toombudra. The southern part consists of a series of valleys, opening to the north, and containing the branches of the Pennar and Toombudra. These valleys, of which there are five or six in the southern part of the country, are there parallel to each other, and divided by low ranges of hills, which are generally destitute of woods, and present vast dull masses of bare rock, and these give the country an appearance of sterility at first sight, which it does not in reality merit. About the centre of the country, where the Pennar turns toward the east, there is a plain of very considerable extent, reaching from that river to the Toombudra, where they are more than sixty miles asunder.

The soil of the Balaghaut country is in general fertile, especially upon the rich black loam, the first ploughing of which is a very serious matter; but, with proper care, it requires no more of the plough for at least twenty years.

From the greater elevation and the different nature of the soil, this country does not require nearly so much water as the sandy plain of the

Carnatic, a day or two, in the proper season, being sufficient for insuring a crop. But even that little is not always obtained: for the Ghauts are between it and the sea both ways, and thus both monsoons bring dry weather, and the crop is lost. There is a good deal of watering too; and when it came into the hands of the British, the number of wells for that purpose was upwards of fifty thousand. There are some strong *droogs*, or rock forts, in the Balaghaut country, the chief of which is Gooty-droog, near the river Pennar.

MYSORE.—This country occupies the remainder of the table land of India south of the Krishna; being the central and most elevated part, and the southern slope, and extending to the western Ghauts throughout its whole length, and to the eastern, from the parallel of Madras southward. The most elevated part of the plain is about the same parallel, which is nearly also that of the town and fort of Bangalore; and there the level is about three thousand feet above that of the sea, while Sivagunga, the highest mountain in the country, rises only to the height of one thousand six hundred feet more, or four thousand six hundred above the level of the sea. The elevations by which the table land of the Mysore is broken, do not, indeed, always merit the name of mountains,

for they are often large masses of sienite, or granite, rounded in their outlines, and standing, naked and detached, or in clusters together, upon the plain. From this highest elevation, which stretches across the country from east to west, the greater part of the rivers of the Mysore have their origin. These are the principal branches of the Toombudra, the Pennar, the Punair, and the Cavery; but, with the exception of the Cavery, none of them acquire any considerable magnitude before leaving the country. The Cavery receives a number of small tributaries from the western Ghauts on the south-west frontier, and issues from the Mysore with nearly the whole volume of its water.

In a country so much elevated as the Mysore, a temperate climate might be expected, near as it is to the equator; and there are some circumstances that give it a different character from the central parts of India, where the distance from sea to sea is greater. The mountainous confines are sufficient to break the violence of the seasonal rains, though a portion of each reaches into the centre of the country; and therefore, it is neither deluged nor destitute of water. Deficiency is the imperfection, however, and therefore recourse is had to wells and tanks, though these are not so very numerous as in other

parts of India. The soil is, in many places, impregnated with salts of soda, both the muriate and the carbonate; and on that account the water which is drawn from the wells is not so pure, or so much esteemed, as the rain-water that is collected in wells.

Much of the Mysore is overrun by jungles; and, as is the case in so many parts of India, there are evidences of more numerous population, and more extended industry, at some former period, than the country now exhibits. The causes of the change for the worst are to be found in those desolating wars to which the country was exposed during the latter half of the last century, and not so much to any failure of the crops, or epidemic disease; for the seasons are not so uncertain in the Mysore as in some of the other elevated parts of peninsular India, and the climate is comparatively healthy.

The Mysore remained in a state of tranquillity after the greater part of the north of India had been subjected to invasion and conquest; and it was not till the time of the Mahrattas, and of Hyder Ali, and his son Tippoo, that it was wasted. This accounts for the hedges and other vestiges of industry being more recent and less decayed than those in places toward the north, and also for the greater purity

of the Hindû manners. The Mahomedans had not been very long in the country when Tippoo fell; and as they looked upon him as a martyr that had fallen in the sacred cause of religion, they left the country when the English took possession, and restored, as their dependent, the representative of the ancient Hindû rajah.

There are many rock forts in the Mysore, the most remarkable of which, and, indeed, one of the most remarkable in India, is Severndroog, twenty miles to the north-west of Bangalore. It is a vast mass of granite, having a base of about eight miles in circumference, and a height of about half a mile. Around the base there are smaller rocks thickly covered with jungle; but upon the sides of the great rock there are only two shrubs.

CHAPTER VIII.

MINERALOGY, SOIL, AND MINERALS.

It would not be consistent either with the nature or the limits of this little work to enter into a detailed account of the structure of India, neither are the materials for such an inquiry very complete; but still some general hints are necessary, in order to arrive at a fair and legitimate estimate of the country, as the scene of human industry; because, though temperature and humidity are the grand elements in the agricultural value of a country, the rock is of importance, as it enters into, and in so far modifies, the soil of every country, and especially a country where the decomposing

powers of the atmosphere are peculiarly active. On the value of mineralogy, with reference to the arts, it is unnecessary to say anything; as an Englishman has only to look around him to be convinced that the mines of his country are one of the chief sources of her wealth, and have been the grand stimulus to her industry, and the grand cause of her greatness and her power.

It is true that the mineralogy of India does not bear so high a relation to the produce of the soil; but still it is of some importance: and it is also of some importance to correct the vulgar opinion, that India is a country rich in the precious metals, because that will narrow the subject, and enable us the better to see in what the value and wealth of India really consists.

Generally speaking, India may be considered as what geologists style a primitive country, the rocks being generally granite or sienite, and the sand the decomposition of those rocks. In the Ghauts, and the table land, this is the prevailing rock, and almost the only rock south of the summit part of the Mysore. It is small in the grain, though the component crystals are sharp and angular. Quartz is more than usually abundant in it; and both that and the felspar are very white. Those rocks are, in many places, stratified; and in the Ghauts, on

the west of Coimbatoor, immediately to the south-west of Mysore, the strata are nearly perpendicular, and cleft by deep fissures. The evidence is scanty, however, and the general stratification of the rock on the southern table land is not very clearly established. In the centre of the district the rock passes into granitic porphyry, the structure of which is much more angular than that of the granite and sienite; and it is on these porphyretic points that the *droogs*, or strong forts, are mostly situated. The decomposition of this porphyry is in a state of much more minute division than that of the more granular rock, and that, in some measure, accounts for the greater tenacity of the soil.

Lime is found in the bed of the Palaur, near Arcot; and, in some places of the neighbourhood, it is in general found in nodules, and is of a very compact texture.

The whole of this part of India is very much impregnated with iron; and there are several native manufactories, both of iron and steel, in the Mysore. The general kind of ore used is not mentioned; but it is said to yield forty-seven per cent. of impure malleable iron. The torrents of the eastern Ghauts carry down great quantities of black sand, which contains a good deal of iron, and is used at the furnaces. The

ferruginous strata also extend to the Malabar coast, where there are many furnaces. It does not appear that any other metal has been found in this part of India.

The descriptions given of the soil in this district would lead us to conclude, that some strata had once, partially at least, been incumbent upon the granite and sienite, but which is now decomposed. The red soil would indicate the former presence of some species of sandstone, and also limestone; and the black soil would lead to the conclusion that there had once been a portion of trap formation, such as clay-stone or green-stone porphyry. The black sand, containing the iron, is another indication of something of this description; and it is by no means improbable that a rock of this kind reposes on the primitive formations once extended from the part of Gundwana. There are said still to be wild angular rocks of it along the high grounds, in which all the branches of the Godavery and the Krishna have their sources; and this is rendered the more probable by the fact that agates and cornelians, which are mostly found in the trap formations, are found in the bed of the Krishna; and, also, though, it is said, more sparingly, in that of the Godavery.

In the Balaghaut district, the formation is a

little different from that of the Mysore; and upon both banks of the Pennar, near Cuddapah, there are diamond mines. These are found in the alluvial soil of the Nalla Malla ridge, which stretches across the beds of the Pennar and the Krishna; but there is no evidence of any being obtained in that ridge to the north of the latter river. These are always found in a sand-stone gravel, or in a breccia, of which sand-stone is the chief ingredient; and there are other evidences of a less compact formation in that ridge than in the table land of the Balaghaut to the westward. The springs are so numerous that, though the heat be very great, the whole of the streams are perennial.

The black soil is found more or less in all the upper valleys, toward the hills as far as the great Gangetic plain; and the débris found in the Mahanuddy would lead to the conclusion, that both the trap and the sand-stone formation are to be met with in the central and rocky parts of Gundwana. Diamonds, and also opaque or semi-transparent stones, are found in the bed of that river, and iron is worked in the adjoining hills. Before the cruelties of the Mahrattas, by which the Deccan was, to a great extent, depopulated, and the few people that were left driven into the fastnesses of the

woods, a considerable trade in diamonds and gold-dust was carried on by the inhabitants of Sumbhulpoor, on the Mahanuddy. The gold-dust was found by levigating the sand of the mountain torrents, and the diamonds are now found only in the same manner; but, though they are not now known, or, at any rate, not worked, the general opinion is, that there once were regular mines in this part of the Deccan, as productive as those of Pannah, in Allahabad. As is the case there, and, indeed, in every place where diamonds have been found, the soil containing them has been gravel. It may farther be noticed, that those diamond soils are uniformly sterile, composed of sand-stone and clay-stone of the least productive character; and that they form naked patches amid the exuberant vegetation both of India and Brazil. This table-land is, however, very little known; and almost the whole of our information respecting it, depends upon the Hindû pilgrims, who visit, as a place of sanctity, the sources of the rivers there. From what is known, one would be led to conclude, that both sand-stone and the trap formation are more frequent here than to the south of the Nerbudda. In point of extreme difficulty of access, unhealthiness, and beasts of prey, this is the most wretched part of India; but it is probably the one where

mineralogical research would meet with the most ample reward.

Toward the north and west, the hills are more detached and irregular; and there is said to be a good deal of whinstone and marble; but throughout the whole country, to the south of the great Gangetic plain, granite and granitic porphyry are the prevailing rocks; and it is not impossible that that which has been described as a trap formation may be porphyry, the columnar form of which often very much resembles that of the trap formations.

Farther to the north, even after the country has become in a great measure a desert, there are hills of the granite formation. Of this character are the mountains of Aboo, in Ajmeer, which rise quite insulated over the plain.

The great plain of the Ganges, the banks of the Indus, and the country between, exhibit one of the greatest masses of alluvial matter anywhere to be met with. In the delta of the Ganges, and to the distance of four hundred miles from the sea, there is not a single rock, or even a nodule of gravel; the substratum is everywhere clay, over which there lies, in most places, a very thick bed of black and fertile mould. At a little distance from the river, the substratum is sometimes lime, and sometimes

rock; but no rock appears on the banks or in the bed of the Ganges, lower down than Oudewalla in the province of Bahar, where a spur from the high land to the west of Bengal, comes down to the river. Above this, the valley of the Ganges continues to possess its rich and fertile mould; but the valley is more gravelly toward the Jumnah, and beyond that river it passes into desert, the upper part of which appears to be indurated clay, and the lower, sand, much impregnated with saline matters.

Of the structure of the great ridge of the Himalaya, and the belt of hilly country that lies between that and the plain of the Ganges, not a great deal is known; but they do not appear to be so exclusively granitic as the mountains in the Deccan and south of India; and resemble more in their general structure, the mountains of Europe. The elevations immediately on the verge of the low land, are, in a great measure, composed of gravel, as if they had been acted upon by a flood far mightier than the Ganges. Those hills always contain pebbles rounded as by the action of water, and sometimes the matter with which they are united is clay, very much indurated. Any rock which does occur in those lower hills

is sand-stone. This description of country does not, in general, rise to a height of more than fifteen hundred feet.

This first elevation, which, however it has been formed, must be considered as an alluvion, is succeeded by a very rugged tract, the ridges of which are often very narrow, and some of them attain the height of five thousand feet. This is succeeded by a lime-stone formation, the particular characters of which have not been much examined, but some parts of which rise to the height of at least seven thousand feet. Above this, nearly as far as has been explored, the rocks are schistus; but it is supposed that the more elevated summits are granite or porphyry.

Very little is known respecting the minerals in those mountains. The copper mines of Thibet have been already mentioned, as well as the gold which is found in small quantities in the sand of some of the rivers. It does not appear that any trace of silver has been met with in the Himalaya, or in any part of India; but a more important mineral is the rock-salt, which, though it does not cross the bed of the Ganges, at least at the surface, probably traverses the whole length of the country, as appears from the salt springs on the Himalaya side of the Ganges.

Animal and vegetable remains do not appear to be numerous, either in the rock or the soil of India. In the latter we would not be led to expect them, for the decomposing power of the soil is such, that any organized body is dissolved before it be even covered; and then, the soil itself everywhere contains very active principles. Taking the whole productions, animal and vegetable, their production and decomposition belong to the same class of phenomena; and great activity in the one is accompanied with corresponding activity in the other. We have mentioned, that in the soil of the Carnatic, near Madras, there are shells. The same soil contains numbers of petrified trees. Those near Madras are vulgarly said to be tamarind trees; they have attained a hardness equal to coral, receive a fine polish, and are manufactured into trinkets. Farther to the south, and near the banks of the Vaygaroo, petrifactions, still understood to be those of the tamarind tree, are very numerous. One of these is described as being sixty feet long, and eight feet in diameter where thickest. The root of it is so hard as to strike fire with steel; it has nearly the same appearance as chalcedony, takes a similar polish, and is made into the same kind of trinkets. The existence of these trees in a country where marble and granite soon decay at the surface,

is rather a curious matter, and would lead to a belief that a portion, at least, of the sandy country below the Eastern Ghauts, has been formed by a process more violent and summary than the annual deposit by the floods. The natives ascribe a very remote antiquity to those trees; but they are no guides at all in matters of philosophical inquiry, and but very blind and doubtful ones on points of history.

There is one fossil production to which great importance is attached by the natives,—the Salgram stones of the Gunduck,—as each of these is a god ready made. This need not be wondered at in a country where a human being costs less than a donkey, and a divinity still less than a human being. So prone is the Hindû to be devout, that he pays his devotion to anything—a stone or block of wood on which a little red paint is smeared, a potsherd which has been dipt in the Ganges, or the droppings of a cow by the way side, is both a temple and an idol to the all-adoring Hindû. We need not therefore wonder at his adoration of the Salgram stone. In the cliffs of the coast of Durham, or the isle of Sheppy, where the lime and sulphate of iron formation is met with in this country, the Hindûs would find constant subjects of worship, for the *Ammonites* there seem to be nearly the same as those of the Salgram stones.

The ammonites are, as everybody knows, fossil shells, flat, and of a spiral form, marked by indented rings on the outside, at which there are internal *septa*, that nearly meet at the centre, and thus divide the cavity into a number of cells or chambers. A Salgram stone, containing one of these, or the impression of it, is sacred, and some of them are valued at two hundred pounds. A marine origin is generally attributed to those shells, though none of them have been met with in the living, or, indeed, in any other than a fossil state. From their structure, we are led to suppose that they have been inhabitants of very deep water, and have had the power of rising to the surface by filling with air all the cells but the last formed one. In analogous shells, the animal inhabits only the last formed chamber of the shell; but it has a membranous tube that passes through the central opening on all the partitions, and it is supposed to give buoyancy to itself, by inflating that tube with the necessary quantity of air. The cells on these impressions is called the wheel, or chacras, of the Salgram; and those stones in which it does not appear till a portion has been rubbed off, are accounted of the highest value. The Salgrams are imbedded in a schistous rock, of which the chief ingredients are clay and iron, with sometimes a little gold.

The place whence they come is on the borders of Thibet, to the north-east of the great summit of Dhawalaghiri, and close by the limit of perpetual snow, which, in that part of the world, is at least seventeen thousand feet above the level of the sea, which is more than four thousand feet above the level at which fossil shells were found by Humboldt, at Micuipampa, in Peru, and probably the greatest elevation at which the remains of marine animals are found on the globe. The Gunduck, like the Jumnah, is said to issue from hot springs, occasioned, like these by the decomposition of pyrites; and independently of the Salgrams, it is a place of peculiar sanctity. The bed from which the petrifactions are worked is a precipice, into which the river cuts, near Muktanath, in a very cold and wild part of the country, and they are found scattered all over its bed from thence through Nepâl, to the valley of the Ganges.

This fossil has attracted the attention, and engaged the superstition, of people in many countries. The horns of Jupiter Ammon, the volutes of the Ionic capital, the thousands of snakes, large and small, which pious persons of old converted into stone in the north of England, all have had their origin nearly the same; and it is certainly not a little singular, that a

shell so generally diffused, capable of attaining such a size, and found in places so elevated, should not now be met with in the ocean; and also that at the highest locality at which it is found, the loftiest mountain should be between it and the sea.

Even the Indian fable, that gives sanctity to the Salgram (absurd as the fables of Hindû mythology generally are), is worthy of notice.

The three principal manifestations of Brahm, the Eternal and Unseen, are Brahma the creator, Vishnû the preserver, and Siva the destroyer. One of the labours of Vishnû was the creation of nine planets, the destinies of the human race, and of all else, with the exception of Brahm himself. When Sani, or Saturn, began his sway, by intimating that Brahma must submit to him for twelve years, Brahma did not much relish the proposal; and hinted to Sani, that he would gain more glory by showing the extent of his influence upon his maker Vishnû. Sani took the hint, called upon the preserver, and intimated his intention. "Call to-morrow," said Vishnû, and Sani withdrew. The moment that he was gone, Vishnû, finding that all his powers as preserver would not preserve him from the baleful influence of Sani, resolved to keep out of his way; and for this

purpose, he either changed himself into the mountain Gandhaki, or crept into it, there to lie snug for the twelve years. On the morrow Sani came; but there was no Vishnû to meet him; and Sani's indignation became so hot, that it changed him into a thunderbolt. In that form, which was something like that of a worm, he continued to drill the god-mountain through and through the body for the whole twelve years, inflicting upon him the most indescribable torture. When the time elapsed, and Vishnû got out, he commanded the Salgram marks to be worshipped as the wounds that he had received during the twelve years that he had been schistus. Such is the origin of the Salgrams of Gandhaki, and their sanctity is implicitly believed by millions of people.

But Vishnû would have required to change himself into a great part of the Himalaya, as ammonites are found in all the upper ghauts, or passes, of the lofty ridge that have been examined. In the Niti Ghaut, which leads from Hindûstan to Thibet, along the course of the Dauli branch of the Ganges, they are found at an elevation of nearly seventeen thousand feet; and as that river, as well as the Gunduck, rises on the Thibet side of the great central chain, it is very probable that the formation containing these marine remains, occupies a great extent of

the north-eastern slope of the mountains. Few as the observations have been, this formation has been found at points nearly three hundred miles asunder; and that extent, at the great elevation that has been mentioned, is a singular feature in geology, and a great contrast to the total absence of animal remains in the Deccan and south of India.

The Andes are, next to the Himalaya, the highest mountains in the world, and granite is not found in them above the level of eleven thousand five hundred feet, the loftiest parts of the mountains being chiefly composed of porphyry. The same is the case in the highest part of the Balaghaut and Mysore; and from the scarped and columnar form which has been mentioned as belonging to the Himalaya, in the more lofty parts, it is possible that their formation may be the same. But whatever may be the composition of those mighty mountains—and that can be ascertained only after years of the most careful examination—they certainly stand "alone in their glory," as the most remarkable feature of our globe. Besides their form and magnitude, and the influence that they have in diffusing fertility over the country, their three most remarkable features seem to be the absence of any thing like a coal formation, the absence of volcanoes, and the

absence of earthquakes,—the last two of which being in a great measure connected with each other. The Andes have still their blazing summits at various points of the range; there are the vestiges of many volcanoes that are now quenched, even near the polar sea, where they subside to a moderate elevation, there are subterraneous fires; the whole of the table land from which their most elevated peaks arise, is one scene of ruin, from the action of earthquakes; and those convulsions of nature extend their devastations to the chains that branch off. The Himalaya, on the other hand, stand in tranquil majesty, and work by means of no agent but the atmosphere; and, except the violence of the storm and the severity of the cold, there is nothing to annoy upon even their loftiest slopes. There are some warm springs; but nothing that resembles ignition; and the heat of those springs appears to be local—the decomposition of salts of iron near the spot whence the water issues. The remarkable tranquillity of the Asian mountains, in this respect, while there are volcanoes in the Asiatic isles, give some confirmation to the theory that the real cause of volcanic action is the sea, or, at any rate, water at a great depth in the earth, where the elements of that fluid are separated from each other by some chemical action, by means

of which one substance attracts the hydrogen of one portion, and another substance the oxygen of another; and the two gases meeting together, occasion that intense ignition, by which all the carbonaceous parts of the rock are consumed, and the remainder melted into glass. No inference can be drawn one way or another, from the presence or absence of volcanoes, that can in any way illustrate the structure of the mountains. They do not appear to have any necessary connexion either with inflammable or metallic strata; but are of such power as to convert into fuel all substances, and water among the rest.

The absence of volcanoes, while it gives an idea of sterility to the Himalaya ridge, narrows the view which it is necessary to take of it,—enables us to look upon it as a perennial barrier between the north and the south, which, by the daily thawing of its snows during the dry and warm months, preserves water in the channels of a thousand rivers; and by dashing back the seasonal floods from the sea, spreads over the country a new soil every season. But, while the Himalaya continue to perform this operation in the meteorology of India, the people of that country need not envy the South Americans of the mines contained in the Andes; nor need they heed much the golden sand of their

own rivers. The wealth of India is in her soil; and thence also, her nitre, the mineral of most value that she exports, is derived. Iron is found in abundance; and in a country where a forest springs up in the course of a year, mineral coal would be almost superfluous.

One of the most singular features in the soil of India is the manner in which the great plain of the Ganges terminates—the quantity of land, apparently too soft for culture, containing very little fresh water, and yet being loaded with an excessive vegetation, having no parallel in the world; the whole country, from Calcutta to the sea, and from the Hoogly to the eastern branch of the Ganges, being about one hundred and eighty miles from east to west, and seventy from north to south, consisting wholly of the richest alluvial soil, without a rock, a bit of stone, or any thing that can be considered as sand, and lying among the mouths of the finest rivers in the world, is a perfect desert, and the property of nobody. It consists of a countless number of islands, divided from each other by portions of water, of endless varieties of extent and depth—in general salt when the river is low, and then displaying the successive layers of alluvion, of which the inter-

mediate spaces are composed, but flooded quite up to the foliage of the trees, with which these are every where covered, when the river is swollen. A passage across this place is singularly striking, and the windings of the channels make it both long and intricate. The woods are luxuriant and beautiful; sometimes they so close in upon the channel that the sprays almost touch; at others they have an opening of miles, as calm and glassy as a lake. Those woods are very thickly inhabited. The waters contain great numbers of alligators, whose large bodies lie along the mud, having more the appearance of logs that have been drifted there by the flood, than of living creatures, till they are alarmed, and run to the water. The boughs and branches swarm with parrots and other birds, the noise of which would lead one to believe that the interior is full of farm-yards; while it is one continued chatter of monkeys, jumping and climbing from branch to branch. Deer are also abundant; and the tigers, as they have an ample supply of food, and are not followed by man, are very numerous, large, and daring. To land is a matter of the most imminent danger, and to approach the shore in a boat is far from safe. Yet superstition and the love of gain (probably

they are the same thing,) bring a few persons to this singular place. The former are devotees, who live because they are "tiger proof;" but the fate of by far the greater number—eventually, perhaps, of them all—shews that the tigers do not care much for their sanctity. Those who resort there for the more obvious purposes of gain are salt gatherers and wood-cutters. The former are not quite in so much jeopardy: but many of the latter are carried off. And yet the Hindûs have a holy place, and a sort of sanctuary, upon that dangerous country. Those are on the island of Sagor, the farthest to seaward, at the entrance of the Hoogly. The Hoogly is the most sacred branch of that most sacred river the Ganges, and bears the bodies of thousands upon its tide to the sea. Its final confluence with that body of water is, of course, the most holy place of it; and the quantity of sin that is washed away by a dip there is worthy of being sought for through any danger. Accordingly, during the full moons in November and January, there is a resort of pilgrims to Sagor, when a few, both old and young, are sacrificed to appease the gods, and a few more are made prize of by the tigers.

The island, or rather cluster, of Sagor, (for

there are channels across it during the floods,) is of considerable extent; and, besides being much more accessible, it is much more healthy than the part of the Hoogly nearer Calcutta, as the air is from the sea, and consequently cooler, and not so much impregnated with miasmata as that which has passed over a considerable portion of the Sunderbunds. If, therefore, it could be cleared, and a town built upon it, that town would soon monopolize the export trade of Bengal. Attempts have been made with some such view as that; and, under one of the parties of adventurers, a sort of regular campaign was opened against the Tippoos of Sagur. But those quadruped monarchs of the jungle were found to be as valiant as their namesake of Seringapatam, and the fortune of war flowed more in their favour. A fortified inclosure, or stockade, was constructed, of such elevation as to be tiger proof; and though the beasts came every night to the siege, they never succeeded in making a practicable breach. Their serenade was not, however, the most agreeable, neither was it calculated to give the garrison a keener zest for the sally of the morning, that, as they went their rounds to see if all stood fast, their lantern lit up the glare of a great fiery eye, or the "pat" of a massive

paw made the posts shake as if it had been the blow of a battering-ram. With the advantage of the stockade the garrison had the better of the besiegers; but when they sallied out to attack the strong-holds of the tigers in return, these generally had so much the advantage, that the assailants at last abandoned the enterprize, and Sagur is an independent native state.

The islands at the eastern entrance of the Ganges are more valuable. Sundeep is about sixteen miles long and eight broad. It is wholly made up of alluvial soil, and cleared, and well cultivated; and, with the adjoining islands, it is capable of supporting a considerable population. But, like Sagur, it was once the abode of men as fell and ferocious as tigers. In the sixteenth century the Portuguese settled in considerable numbers on the adjoining coasts of Arracan and Chittagong; but on account of the cruelties that they perpetrated, they were driven out about 1607; upon which they took possession of Sundeep, expelled the Moguls, and continued to infest the neighbouring seas as pirates, till they were expelled in their turn by the Mughs of Arracan. These were still more ferocious than their predecessors. They devastated the adjoining parts of Bengal, carried off the people, and sold them as slaves. In 1666,

the Mogul governor attacked the plunderers, and exterminated them, after a terrible resistance; and, subsequently, Sundeep and the adjoining isles passed into the possession of the British.

CHAPTER IX.

CLIMATE AND SEASONS.

MONSOON IN THE GHAUTS.

THOSE who inhabit a small and insulated country, which lies in too high a latitude for being much affected by the general action of the sun upon the air and the sea, as modified by

the earth's motion, and which is cut off from other lands by the uniform surface and comparatively uniform temperature of the water by which it is surrounded, can form but a very faint notion of the climate of such a country as India. It is true that, even in England, we find a difference between the climate and the seasons on the two sides of the island. The cold winds which, in the latter part of spring, and the early summer, come across the British sea, from the chilled surface of the damp low countries on the opposite shore, become warmed as they touch the comparatively dry land of England. They acquire an evaporative power from the heat which they abstract; and, therefore, instead of relieving the earth by fertilizing showers, they absorb the moisture of the leaves, and dry and wither the buds. In autumn, again, their effect is different, more especially toward the north, where the sea is wider, and the dry sands of Lower Saxony on the opposite sides; the air passing over that soil, after it has been exposed to the heat of the summer, acquires a strong evaporative power, by means of which it takes up a great portion of moisture as it passes over the sea, and this moisture is poured down in the rains which fall late in the summer, or in the autumn, and deluge the northern parts of our eastern coast. On

the other hand, the winds that come from the Atlantic, where they have to pass a vast expanse of water, carry no drying blight upon their wings, but are humid at all seasons. Thus we find that in England, distant as it is from the equator, and surrounded as it is by sea, there is a modification of the weather, arising from the adjacent surfaces. There is another, arising from local surface itself. Those who have moved about much in the open air must often have observed how constantly those floating clouds which are laden with the occasional showers of summer, are seen moving towards the cliffs and heights as if there were an affinity between them. There is such an affinity, both from the attraction of gravitation and from chemical influence; and both increase with the abruptness and elevation of the steep. There are often showers along the cliffy shores of Kent, while not a drop falls upon the marshes or the low downs in Essex; and while the bold coast of Yorkshire is in storms, all is serene upon the flats and fens of Lincolnshire. The warring of winds around a promontory is a common expression; but we do not hear of the same elemental strife along a low point of sand. Thus there are three circumstances by which the climate of any portion of the earth must be modified: the position in latitude, the nature

of the surrounding regions, and the form of the surface.

Now when we look back at what has been mentioned with regard to India, we find that there all those three modifying causes are very great. One half of the surface lies within the tropic in position, and we shall see, by and by, that the remainder is, by its structure, brought within the tropic in respect of climate and temperature. The surrounding regions are as varied as can well be imagined: the sea on the south-west and south-east; an arid country on the west, extending, with comparatively few interruptions, the whole way to the west of Africa; and on the north and north-east, a chain of mountains, so lofty that, except during the warm months, a cloud cannot pass them, even in the lower openings to the interior, without being frozen and precipitated in snow,—with an elevated table-land beyond which must have less than the average quantity of moisture, and therefore more than the average quantity of heat. From the comparative dryness there will be a less waste of that heat by evaporation, and consequently more will be given out by radiation to heat the atmosphere. Along the whole west coast of India too there are mountains, in a continuous ridge, and at no great distance from the sea, with only a small inter-

ruption on the Gulf of Cambay, and the elevation is probably continued in the hills of the Gujerat Peninsula; not is it till the Gulf of Cutch be reached, that we have an extent of country with a low and flat shore, and reaching, without any intervening elevation of any consequence, all the way to the opposite mountain boundary. On the east, too, there are only partial openings till we come to the plain of the Ganges, which reaches along the base of the highest part of the mountains. Looking across the Indian ocean on the south-west, too, we find a general cause of atmospherical action in Arabia and the continent of Africa, which we know to be subject to heavy periodical rains, and droughts as severe,—more especially in that part of Africa which lies farther to the south than India. It is farther to be borne in mind, that the whole of India is a country destitute of lakes or expanses of water; that the centre of the south is an elevated table land; and that the western part is a dry desert, from the Gulf of Cutch to the banks of the Sutledj.

Taking all those circumstances together, they give a peculiarity to the seasons and the temperature of India, which could not be inferred from any general theory of climate, or from observation in any other part of the world.

In tropical countries, the general motion of the atmosphere is toward the point where the sun is vertical; but as the motion of the earth eastward gives that point a motion westward of about one thousand miles an hour at the equator, the general motion of the tropical atmosphere is west, or to the north of west on the south side of the parallel over which the vertical sun passes, and to the south of west on the north side of it. This motion is the trade wind, which is found constant and regular only out at sea upon the uniform surface of the great oceans,—the Atlantic and Pacific; that in the Indian Ocean being prevented by the action of the dry land of Australia on the east side, and that of Africa on the west. Thus the action of the atmospheric current in the Indian Ocean is local; and it is from north to south, or south to north, according to the season. Those winds are called the *monsoons*, from the Persian word for seasons; and they regulate the climate of India, being put in motion by the local circumstances to which we have alluded. A wind from the sea always contains a great portion of moisture, which it deposits when it meets with high land, with violence in proportion to the elevation of the obstacle and its proximity to the sea; in proportion also to the extent of the sea and the warmth. A wind from the land is

dry, more especially one from a land such as that on the north of India, where, as we have said, a rain cloud cannot, unless under very particular circumstances, pass the mountains.

The commencement of the year may be considered as the time of general tranquillity of the elements in India. Sometimes, indeed, the coast of the Carnatic is stormy even then. The storms do not, however, extend far into January, and in most other parts of India, they are over by about the month of October; the wind is then, generally speaking, from the north; and though it is cold in the high parts of the northern country, and rather chilly in some of those of the south, there is no rain, and no snow but in cold and elevated districts.

This wind, which descends from the mountains, and becomes heated as it passes over the Valley of the Ganges and the desert, acquires thereby a very great evaporative power; and though this is agreeable as long as there is much humidity in the soil to produce cold by evaporation, the ground gradually becomes dry, vegetation withers in every place where it is not irrigated by nature or by art, the clay soil becomes as hard as a brick, the rich loams are in dust, and the heat of the air is excessive. It becomes impregnated with acrid gases, and the burning wind of the desert extends its

ravages into the Valley of the Ganges as far as the upper part of Bengal. As the drought continues and increases, the whole country feels its effects, except the upper valleys in the north, which are both cooled and watered by the snows which then begin to melt upon the Hindû Cosh and the Himalaya, and render the climate delightful and the earth fertile. Over the rest of the country this arid state of things continues to increase for about four months, and notwithstanding the incessant action of tanks, and wells, and water-courses, and the great labour by which that action is kept up, desolation threatens all the productions of the earth—while the frame even of the native is relaxed by the heat, and becomes less efficient as the necessity of his labour becomes more urgent.

But the cure of this state of things is involved in the cause: the return of the sun from the southern tropic, which produces the great heat, brings northward with it the parallel of solar action in the atmosphere, and with that a general motion of the mass of the air, loaded with the vapour of the ocean, and heated by the immediate action of the sun, though not so much so as that which is over the burning land of India, and of which the motion, though generally a tranquil one, has, during the dry season,

been from the north. The dry air from the land, and the moist air from the sea, first meet at the southern part of the Malabar coast; and the first effect is the formation of vast volumes of clouds which pass on to the north-east, are redissolved by the dry air, till strata having great differences of temperature and moisture, and consequently great differences of electric state, are blended together, and violent hurricanes, thunder and lightning, and showers of rain, are produced.

This begins about the middle, or toward the end of April; but the great extent of dry surface to the north-east, as well as the proximity, steepness, and height of the Ghauts, the full violence of the monsoon does not take place till toward the end of May, when the rain begins to fall in torrents, which descending the steep gullies of the Ghauts, produce havoc and devastation in the water-courses, and deluge the low grounds between the sand-hills and the sea. As the quantity of rain which falls upon the Ghauts cools the air, a portion of the clouds which were at first dissolved, and carried inland, are poured down upon the table land of the Mysore, though the quantity that extends so far as the eastern Ghauts is inconsiderable, and sometimes fails. On the summit of the western Ghauts this rain is tremendous, for from three to

six months it is so violent, that out-door labour is nearly suspended, and the people are obliged to confine themselves to their houses, while showers continue for three months more. Those rains are most violent and prolonged in the country where the Krishna and Toombudra have their sources; and it is rather to be regretted that, on account of the deep and rugged nature of the beds of those rivers, this quantity of water can be turned to comparatively little account.

A portion of this rain makes its way through the passes of the Ghauts toward Cape Comorin, and waters the south of the Carnatic; but while upon the Malabar coast the violence of the rain is overturning rocks, uprooting trees, and sweeping all that it can reach downward in one headlong devastation, the people of the north part of the Carnatic, are panting under a burning sun, or refreshed only by a few occasional showers. They are, however, safe from the violent winds, which, at this season, beat against the Malabar coast. Even with them, however, the sea is not tranquil; for along the Bay of Bengal, the monsoon passes to the north-east, and forces such a volume of water into the bay, as occasions a heavy surf upon the coast.

Violent as the monsoon is, and destructive as are the ravages of the torrents where they do

break the surface, their descent upon the erewhile warm surface, makes vegetation to spring up as if by a miracle. The first and most violent burst of the monsoon seldom continues without interruption for a week; and when the sun again breaks out, it is from a purified sky, upon a regenerated country. The country is all green, and the channels, which but a few days before were dry and red, are filled with flowing streams. For the first month or six weeks, the intervals of fair weather are not long, but they gradually increase; the south-west winds continue till August or September, and they are often, though not always, accompanied by rain.

As one proceeds northward, the monsoon is not so early, neither is it quite so violent, and on the Tuptee and Nerbudda, where the country inclines to the coast, it extends farther into the interior. A portion of rain falls upon the Gujerat; but the hills there and in Ajmeer seem too low for breaking the clouds; and toward the Indus, though the wind be partially felt, it is not always accompanied by rain. The same is sometimes the case in Ajmeer, and when such seasons occur, they are attended with a failure of the crops, and famine. The rain-clouds in this part of India pass over the flat and arid surface of the desert, without any

cause to impede their progress, or otherwise make them part with their humidity; and thus though they fall partially upon the west of Delhi and Sirhind, and occasion the streams which flow there for a short distance, and are then lost in the desert; their principal course is toward the northern part of the Himalaya, and the mountains north of the Sutledj, so that the greater part of their waters flow into the Ganges, and the rivers of the Punjaub.

From the direction given to the current by the south-east coast of India, the great body of water which the monsoon carries into the Bay of Bengal, is borne toward the north-east. On the coast of Arracan, it arrives about the beginning of June, continues longer, and falls to a greater depth than in any other part of India.

Along the shore of the Circars, on the west side of the bay, the case is different, the rains later in setting in, and less abundant when they do come. The portion to the north of the Godavery has showers from the west in June, and moderate rains from the north-east in November; but, in the early part of the season, the heat is very intense, and the air very unhealthy. One principal cause appears to be the extent of naked and burning sands along the coast, the heat of which not only intercepts

the sea-breeze, but brings down a pestilent air from the hills.

In the lower part of Bengal, the current of wind from the north is met by the monsoon from the south-west, without any such interruption as the Ghauts present on the Malabar coast. The action is, therefore, a little different, as the strata of the sea and land winds are left to mingle, at a low elevation, over a much greater extent of country. The atmospherical commotion begins in thunder there about the beginning of May, and its violence is often great; but as there is no mountainous wall, the first showers, though actually deposited by the current from the sea, are driven back by that from the land, so that they have the appearance of coming from the north. The heavy rain sets in in June, and continues till September; and if they cease too early, the autumn becomes very hot, and the air, from the vapour with which it is loaded, very unhealthy. The setting in of the rains in Bengal is accompanied by violent squalls, which render the navigation of the river at all times rather difficult, and far from safe. Those rains are very constant during about two months, after which they are only partial. In Bengal, however, more especially in that part of it which lies to the left of the Ganges, the

mountains begin to exert an influence, and there are variable winds and partial showers not so immediately dependent upon the monsoon, but occasioned by the play of the atmosphere between the low lands on the banks of the river, and the high ones both toward the Himalaya, and on the confines of Bahar.

Before the commencement of the periodical rains, indeed, the Ganges and its branches begin to be swollen by the melting of the snows, so that, though there can be no question that the action of the monsoon extends there, and even to the summits of the mountains, there is a local power of vegetation in the mountains, which, whatever might be the result in the lower part of the valley, at a distance from the stream, would preserve, to a great extent, the fertility of the upper part, the eastern side of the valley, and the immediate western bank of the river. It may be true, indeed it is true, that this also depends, in a great measure, upon the operation of the monsoon; and the flat coast, to the east of the embouchure of the Indus with the desert, on the left bank of that river, may tend to fertilize the Gangetic plains, by supplying the waste of snow upon the Himalaya, because it is doubtful whether a sufficient quantity of moisture be annually carried to those mountains, from the Bay of Bengal alone, for supplying the vast

quantity which the rivers roll annually to that bay in the shape of water.

The same radiation of heat on the table land behind the Himalaya, which causes the melting of the snow by the motion of the air southward in the early part of the season, that is to say, in the part preceding the middle of June, or the beginning of July, tends to transport a portion of the humidity of the Himalaya toward the south. The existence of this radiation, the only means by which we can account for a higher temperature and more elevated cultivation on the north side of the Himalaya, which is exposed to the north, compared with that which lies on the other side, and is exposed to the south, is clearly proved by those very facts, because there is no other principle to which they can be attributed, and their existence is proved beyond all possibility of dispute. But this very circumstance of the air that passes southward from the Himalaya being warmer than that which is usually found in situations so elevated, and its being condensed, and giving out heat, as it descends into the plain, are among the obvious causes why, when the season has brought the parallel of the sun's greatest action into northern latitudes, and thereby occasioned that general motion of the atmosphere toward the north, is one of the immediate causes

of the south-west monsoon. The quantity of rain brought by that monsoon, the evaporation that takes place, and the cold which that produces, as the humid surface extends farther to the north, give the general volume of the air an impetus toward the mountains, by means of which the remainder of the monsoon vapour from the sea, as well as that raised by evaporation from the humid plain, and its fresh and vigorous vegetation, are driven against the Himalaya, and even through the passes, as it is then the warmest season of the year; and thus the table land beyond the mountains is refreshed by the action of the monsoon, led on by the heat which the radiation from that high land itself imparted to the air while moving in the opposite direction. Probably this is the most singular, as well as the most powerful and extended atmospheric action which is any where to be met with; and it is this that, by giving India a law for its own climate, makes it anomalous to those rules which were supposed to be universally applicable to climate before the Himalaya were ascended, and villages and fields found upon them, at altitudes far above that which theorists had fixed as the limit above which water could not exist, except in a state of ice or snow; and that, therefore, instead of the last and hardiest of the phenogamous plants,

opening its flowers, and maturing its seed, not a moss or a lichen could exist. This limit they fixed, under the equator, at little more than fifteen thousand feet; and that, at latitude 31°, it was not much more than eleven thousand. Even after the Dauli branch of the Ganges had been ascended to the pass of Niti; when the temperature in that pass had been found to be 46° in the morning, and as high as 80° at noon; when the wild rose was just expanding its buds, and the birch its leaves there; when the furze was putting on its golden livery, and the barley appearing through the ground; when it was found that there were inhabitants there, and a mid-day temperature nearly equal to that of the West Indies at the level of the sea; and yet that the elevation was nearly seventeen thousand feet, or almost one mile above their termination of the vegetable kingdom; they clung to the hypothesis, and doubted and denied the facts, which have been verified. So dangerous is it to lay down laws for Nature, in ignorance of the principles upon which she acts.

When the sun declines toward the southern tropic, the general motion of the tropical atmosphere is changed from north to south, and the dry season returns to the greater part of India —to almost all that depends on the south-

western monsoon for its humidity. In those parts this change is not so violent as the former, as the wind is drawn away from the land; whereas, when the south-west sets in, it is driven toward it against an opposing current. Several weeks, in consequence, elapse before the north-east monsoon is steady; and, during these, there are light and variable winds. But in the humid country to the north-east of the Bay of Bengal, even the land wind at this season brings showers; and as it proceeds toward the opposite shore of that bay, it occasions heavy rain. On the shore to the north of the Krishna, the north-east monsoon does not produce a great deal of rain. The rain there is furnished by the remainder of the south-western monsoon, or, rather, by the clouds raised from the central country by the evaporation of what falls there, and the heaviest are in autumn, just before the wind begins to blow from the north-east. That wind sweeps nearly parallel to that part of the coast, and breaks with fury on the eastern Ghauts behind the Carnatic, while it rolls a more furious surf upon the beach at Madras than that which is occasioned by the opposite monsoon. October, November, and December are, generally speaking, the most dangerous months on that coast; and by the middle of January the shore is comparatively tranquil

till April, when the surf from the south-west monsoon again sets in.

Such are the general motions of the atmosphere, and the distribution of humidity over India; and upon these the temperature to a very considerable extent depends. As the country, generally speaking, becomes dry for the greater part of the half year between December and June, while the general motion of the atmosphere is southward to the sea, the air, as long as there is moisture to be evaporated, is rather cold. This cold increases rather than diminishes on the high grounds to the southward of the Sone. The cause is obvious. The air there, on its motion southward, ascends from a low to a high level, and, on its ascent, it expands, abstracting caloric from the ground to sustain the expansion. As it descends into the valleys and beds of the rivers, it gives out a little heat by condensation; but as it is constantly shifting, it takes up perhaps as much by evaporation; and as it climbs the southern slopes, it again cools. Thus the winter months are cold upon the high grounds in Hyderabad, although so far within the tropic as to have only about 17° of latitude; and the high land in Mysore is comparatively cold, though three degrees farther to the south. In the latter country the cold is augmented by evapora-

tion from the very rainy tract at the summit of the Western Ghauts.

At Delhi the winter's cold is sometimes 3° or 4° below freezing, and ice is of course formed. At this time, which is in December, the thermometer is as low as 52° during the night at Calcutta, and not more than about 86° during the day: while in Benares and Allahabad, fires are felt very comfortable; and even in the low country, ice is obtained by exposing water during the night in jars of porous earth. There is never any frost in the Deccan or to the south of it; but sometimes the temperature at Hyderabad is only 3° or 4° above freezing. On the coasts the temperature is of course higher; and it is higher on the east coast than on the west; because there is more moisture, and consequently a greater evaporation on the latter. Taking Madras and Bombay as medium stations on the two coasts, the difference in winter may be stated at 7°,—Madras being 71° and Bombay 64°. So long as the evaporation continues to be great, there are very heavy dews, which are hurtful to those exposed to them, in consequence of the cold occasioned by their evaporation from the skin.

As the evaporation is the chief cause of cold in India, and as the succession of drying winds soon exhausts it, the greatest heat arrives earlier

than in Europe. In April and May, before the showers, the thermometer at Calcutta rises to 110°; it is sometimes rather warmer in the Circars, and probably more so in the Carnatic. The warmest month is, of course, that immediately preceding the rains; but on the coasts the excess of heat sometimes brings a sea-breeze; though on coasts like those of the Carnatic and the Circars, that is rendered of no avail in the interior by the sandy and saline shore.

In places where the ground becomes perfectly dry, and where there are no acrid mineral exhalations, the chief danger to health is from exposure to the direct rays of the sun,—a *coup de soleil* being almost the certain result of such temerity. Nor is man the only victim of the burning sky; for birds sometimes drop down dead in the very streets and squares of Calcutta. The usual means with Europeans is to keep their apartments, and procure a ventilation, which is rendered much more refreshing if the air be admitted through mats that are kept moist.

Toward the northern mountains the temperature is very different, and the warm season is comparatively late. Snow falls in vast quantities in the valleys among the Himalaya; and though it does not appear that any body re-

mains in those wilds to describe the storms of their truly Alpine winter, there are evidences that they must be violent. Snow-storms, in countries where the elevation is sufficient, are more violent in the warm latitudes than in the cold—among the mountains of Cantal, in the south of France, than upon the Doffra Fiall, in Norway; and it is probable that they may have a fury, proportionate to the vicinity of the tropic and the height, among the vast peaks of the Himalaya. In the road leading to the seasonal temple and town of Badrinath, on the banks of the Alacananda branch of the Ganges, below the junction of the Dauli, and more than six thousand feet lower than the ghaut or pass of Niti, fragments of snow were found lying undissolved so late as the 29th of May, which measured seventy feet in thickness. It is possible, however, that these may have been the remains of masses that had rolled down, in the manner of minor avalanches, from the hills above, which have an elevation of more than twenty-three thousand feet, or thirteen thousand above the level of Badrinath. But still that elevation, which is stated at ten thousand two hundred and ninety-four feet, does not appear to be habitable, or even approachable, in the winter; as, when that season approaches, the Brahmins, who receive the do-

nations of pilgrims there in the summer, leave their divinity in a hole, to the guardianship of the snows, and betake themselves to a more genial atmosphere.

Farther up, the pass of Niti is not accounted practicable till nearly the end of June; and in the early part of that month, the storms upon the mountains are violent. The morning is, as has been stated, not cold, and the noon is sultry; but apparently from the absorption of heat by the melting of the snow, the weather gets cold and gloomy by three o'clock. The clouds begin to settle upon the mountains, where they deposit snow upon the peaks, and rain on the lower slopes. The quantity of snow that falls is sufficient to cover the mountains, which, at day-break, present one mass of snow. The heat of the early part of next day melts that on the places exposed to the sun; and the melted snow, together with the rain, form that volume of water which, before the monsoon has begun to act in the Valley of the Ganges, floods all the tributaries of that river which have their origin high in the mountains. The summer which comes thus late is of but very short duration, for the snows soon settle down upon the passes and gorges by which the people are driven to the low country,—or, rather, they are warned off before it comes, and

leave the storm in full possession of the mountains till the warm season of a succeeding year. The information which we have respecting the summer in these elevated regions is, however, very scanty; and as to what happens in the winter, there is not now, and there probably will never be, any thing but conjecture.

There is no reason to doubt that, throughout the whole chain of mountains, from the first branch of the river of Cabul, in the west, to the last of the Brahmapootra, in the east, there is the same warm though brief summer, and the same alternate falling and melting of the snow in spring, with the same mass of that substance in the winter. Now those are the causes that give to the land of all the valleys that vast quantity of alluvial soil which renders them so fertile. The alternate freezing and thawing tend to decompose the rock itself—the clay-slate and limestone; the summer finds vegetable matter; and the continued floods, while the snow melts or the rain falls, combine to send the whole mingled together in that way which requires only the assistance of heat and moisture to render it fertile. In this one sees also one reason why the country to the eastward of the Indus should be a desert: the Sutledj cuts off its communication with the mountains for an extent of nearly five hundred miles upon

a parallel of latitude; and, therefore, all that breadth of the country is deprived of the fertilizing influence of the mountain deposits. In that part of the country, too, there is a long succession of secondary hills, so that the Sutledj deposits all the richer matter with which it is charged before it reaches the plain; and therefore it washes toward its confluence with the Indus little else than unprofitable sand, which, the moment that the flood is gone, is burned and dried by an atmosphere that deposits no rain. As has been already noticed, however, this desert facilitates the passage of humidity to the Himalaya; and thus, while it is barren itself, it becomes a minister of fertility to other places.

This annual action must gradually decompose the Himalaya; but the operation is a very slow one, and the very altitude of the great summits insures *them* against decay. Up to seventeen thousand feet the powers of moisture and temperature make their waste; but there is a region above that where all is still and perennial. Clad in its armour of snow, Dhawalaghiri stands untouched by the elements. That snow equally resists the heat of summer and the cold of winter. No water (for water cannot possibly exist at such an altitude) can insinuate into any fissure there during the summer, to

expand and burst the rock by its congelation during the winter; and, probably, the solid parts of the mountain, under the snow, do not vary one degree in temperature in a thousand years. It is true that there can be no life there; but it is equally true, that there can be no decomposition. The rock, could we lay it bare, would be unaltered in a single line from what it was when the snowy mantle was first thrown over it; and, therefore, unless some earthquake or volcano shall shatter it, we know of no power in nature by which it can be in the least altered, till the war of the elements around its base shall have so far removed the lower strata that it shall yield to the power of gravitation, and fall by its own weight; and the prospect toward such a catastrophe is so remote that it needs hardly be looked forward to. And yet, while Dhwalaghiri and his kindred giants continue to hold their places, the climate of India, and the revolutions of the seasons, the wet monsoon from the south, and the dry wind from the north, must remain as they are. No cause that can at present be named or contemplated can affect the mountains; and while they stand there, the monsoon from the south must come, and must be followed by drought and heat. Even though man should cease to labour and abandon the surface—though the tanks, the wells, and the

water-courses should all be given up, and the approach of the desert leave hardly a margin of green along the banks of the rivers—as probably has, to a certain extent, been the case in the western part of the country—the rains of summer would still come to the Himalaya, and they would come in greater abundance, so that the elements of fertility would still remain; and though the labour would be great in proportion as were the neglect, man might again call them into action.

It was mentioned, in the introductory chapter, that the permanence of the people of India, amid the changes of the rest of the world, are very remarkable; and it is a striking coincidence that this permanence should also belong to the country itself. Both may depend on the same cause—"He who lies at the bottom can fall no further." We shall afterwards inquire whether that applies to the people;—that it does to the country, in so far as ordinary causes of change are concerned, all those features, the outlines of which we have attempted to trace, combine to establish. The violent changes of the Indian climate have already done nearly all that they can do in the reduction of the surface. In other countries we find the falls of rivers working their way upward, so as to let out the water of lakes; and we find the sea

invading the shores. But there is no such thing in India: the lakes, of which there are pretty strong evidences in many parts of the country, have already been emptied; and the sea has been so saturated with the débris of the land, that the currents are constantly returning it in sand-banks to the shore. The table lands in the south, if they ever were covered with a softer formation, are now worn to the primary rocks; and though the decomposition of these be in progress, that progress is exceedingly slow. The upland streams have so worn their courses to the solid rock, that all which they can now send down by any one flood is that which has been accumulated since the preceding one; and the larger rivers can now only plough for themselves channels in the matter which they have already deposited, or so elevate their banks and beds by their new deposits, as more conveniently to irrigate the country if it remain cleared and cultivated, or overflow it, and bring it into the luxuriant vegetation of a jungle, if it were left to nature. The rain that falls upon the surface of India during the hot season, if that surface be such as to retain it for ever so short a time, will not lie idle. If you duly water any surface it will, in time, yield you a crop. The germs of plants are so minute, that they may be anywhere without one

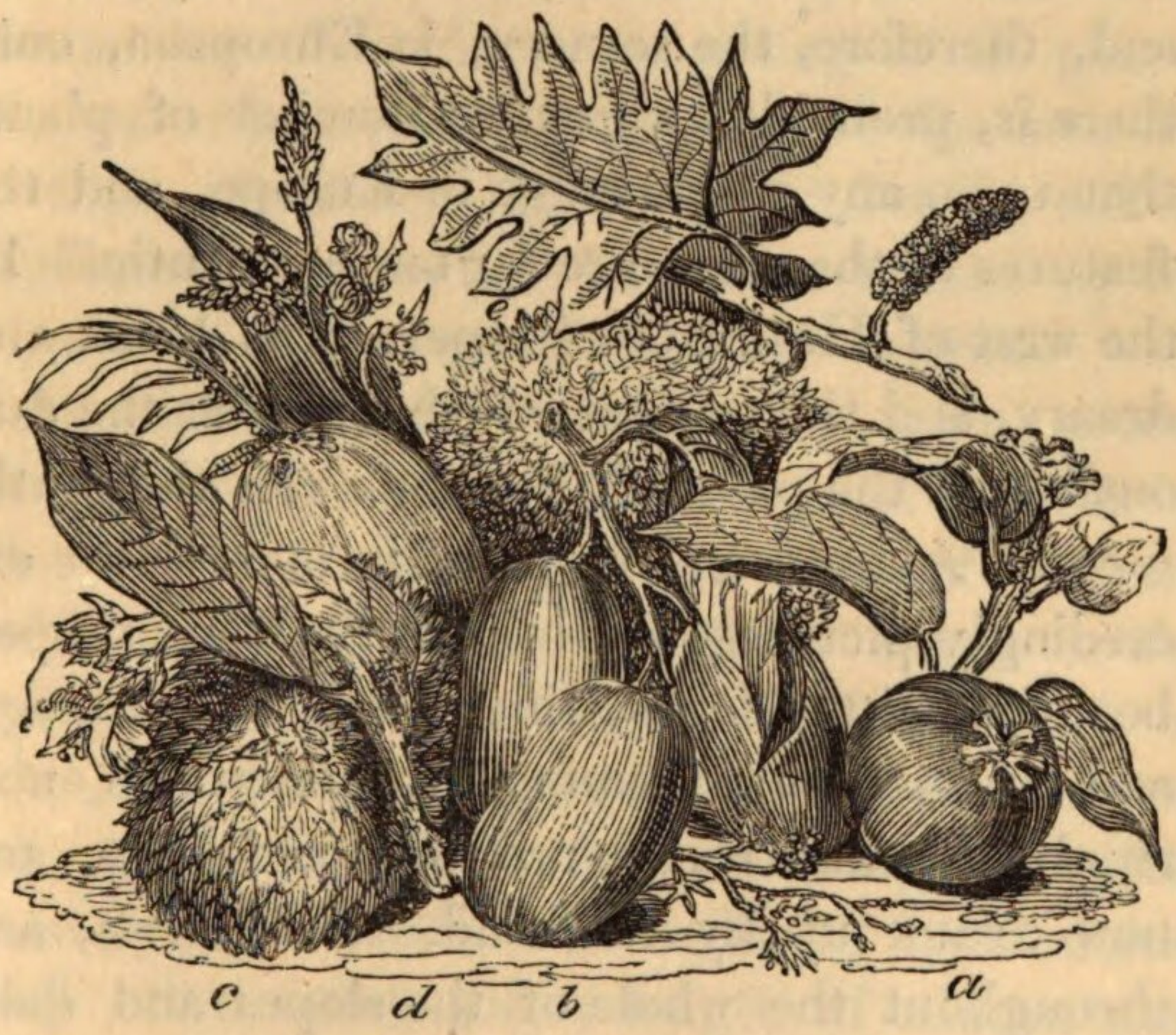
observing them, and they may be moved about by very slight causes. The seeds of the common puffball are so minute, that more than six hundred millions of them are contained in a single solid inch, and one plant must often contain many more than that number. But that is comparatively a large plant; and, though there be no necessary connexion between the size of the seed and that of the plant, (the seed of the Windsor bean being much larger than that of the pine,) there is no reason to conclude that the seed of the puffball is the smallest in nature. It may give us some idea, however, of the minute size and the vast number. Now, it seems to be a law of nature, that the smaller any germ of life is, the more proof it is against destruction. Boiling water, which destroys the principle of life in the egg of an ostrich, has not the same effect upon that of a fly; and cold, which destroys the vegetable power of fruits, has no effect upon that of mosses and lichens. Therefore, "if you duly water a rock, and the temperature be, at any time of the year, ever so little above the freezing point, it will, in time, yield you a crop." If the desert on the Indus could be watered, the lichens, the mosses, and all the plants, up to the forest tree, would return.

Indeed, it is in a great measure because the

plains of India are under cultivation, that they become dry and naked during the warm and thirsty months. The native jungle would retain humidity, and would gradually invade the deserts, just as it has invaded the neglected lands on the south of the Nerbudda. The vegetation which such a climate as that of India would naturally produce, is not, however, that which is most useful to man, or most desirable in commerce; and, therefore, with greater productive powers in the soil, and greater energies in the climate, more labour of man is required, to prevent the greater portion of India from reverting to a thick forest, swarming with ravenous beasts, and the rest from passing into a desert of sand, than is necessary in places where the soil is less fertile and the climate less active. But there is this compensation, that, when the industry is exerted, the reward is proportionate.

CHAPTER X.

SCENERY AND VEGETATION.



GROUP OF FRUITS.

Upon those subjects, only a few hints can be afforded in order to make the outline complete; for they are so extensive and so varied in their characters, that no reasonable limits would include the details, and no ordinary language

would do them justice. From the perennial snows to the burning sands of the Carnatic, there is every climate and every variety of surface, with every degree of fertility; and, therefore, an Indian scene is almost anything that the fancy can imagine; and an Indian plant leaves a very large portion of the botanical collection open for choice. In the mountains, the vegetation, and, therefore, the scenery, is European, only there is, probably, a greater number of plants than upon any single ridge in Europe, and the features of the scene are far more gigantic. In the west of Hindûstan Proper, it is bleak and dreary, and there is not much to break the dull outline of the parched horizon. In the south-west of Ajmeer and Gujerat, it is at times exceedingly picturesque; hills of fantastic shapes, beautiful little lakes, thickets of rich foliage, and streams, now foaming over precipices, now rippling round rocks, now lost in foliage, and now drunk up by the sand. In Malwa, and throughout the whole of the slopes and dells that intersect the higher part of the Deccan, the scenery is luxuriant; and where the population is scanty, it is either wild and impenetrable with jungle, consisting of large trees, laced together with creeping and parasitical plants, or it is an arid waste; but still there rises here and there some rude rock, that overtops the

whole, whether in the naked wild or the tangled forest. The whole of the west coast from Surat southward, is singularly picturesque; groves of cocoas, and other palms, which are entwined with the pepper plant, over which rise little mounds with trees, all new to an European eye, and many of them not yet named in botany; while behind those again there is a succession of verdure, consisting of all plants that can bear the heat, and live for months without moisture. These are broken by naked cliffs, and ravines that have been broken up by the rains; and over all, the majestic teak raises its lofty form, and bears some resemblance to giant mountains seen over the whole. Sand-banks, and rocks, and inlets of the sea, with pools and streams of fresh water, in the rainy season, give effect to the foreground of this singular scene,—a scene which is rendered the more remarkable by stretching, with less variety than there is to be found upon almost any other coast, for a length of almost nine hundred miles.

Nor is this singularity of appearance confined to the mere line of the coast; for it continues till the Ghauts be ascended, and the table land gained. The Ghauts, or passes, are so rough and steep, that they cannot, in general, be ascended, and far less descended, with

wheel carriages. At one place the masses of rock are so near to each other, that the trees meet over head, and cause a sort of twilight under the utmost influence of the vertical sun; a turning of this opens a prospect of the low country all the way to the sea; another passes shelving over the brink of a frightful precipice; from a third, one looks down into a natural basin, of which the sides are rocks, the crevices of which are stuck full of plants, and the bottom one mass of trees which cover the ground, which are yet perfectly alive with monkeys and birds. Occasionally a stream of water may be observed in the middle of the mass of foliage; and sometimes a small cascade pours its flood full into the abyss.

On the coast of the Carnatic, the scenery is rather tame, from the flat and arid character of the country below the Ghauts; and even the mountains in that part of India have not the magnificence of those on the west coast; but at some distance from the sea, the country, from the Cavery to Cape Comorin, has a good deal of the character of the Oriental Isles. As we have said, however, words cannot convey an adequate notion of Indian scenery. In a country where the grass forms groves, and the reed emulates in height the spiry poplar of England,—where the palm and the cinnamon are

met with at the one extremity, and the pine of Scotland and Norway—and even the dwarf-birch of Lapland are found at the other,—to paint the scenery would require a canvas equal in extent to the country. The vegetation is almost as difficult, and therefore we shall notice only a few of the more valuable species.

Among the forest or timber trees of India, the first place, in utility, and far from the last in majestic beauty, must be given to the TEAK (*tectona grandis*). The teak is not universally diffused over the country; but in the places where it is found, it is generally so abundant as to give a character to the forest. Its chief localities are the Western Ghauts, the Rajahmundry hills on the Godavery, in the back country of the Circars, and on the east side of the Bay of Bengal, in the vicinity of Chittagong. The places on the west coast where this valuable timber is most abundant, are the coasts of Canara and Malabar — in the former of which it is most accessible; but the trees are of larger dimensions in the latter. As has been too often the case with natural forests, however, it appears that more attention has been paid to the cutting down of the existing teak, than to the ensuring of a fresh supply when

that shall be exhausted. More than three thousand trees are cut down annually, in the district of Canara, and no mention is made that any are planted. Those who look only to the present time never bear in mind the fact, that when the more valuable forest trees of any country, or even those that have not been planted by the hand of man, are cut down straight forward, the same species very seldom springs up as a succession. Furze and brambles now luxuriate in some places of England were there once were lofty oaks, and where there would have been oaks still if the trees had been thinned, and not extirpated. Heath and moss are in the same manner occupying the place of the pine forests that have been cut down on the Scottish mountains; and in Australia, which, in situation and climate, more nearly resembles India, a comparatively useless acacia is said to occupy the place from which the cedrela and the casuarina have been removed. The teak of the Malabar coast is reckoned better than that of the banks of the Godavery, and both are said to be more compact than that from the east side of the bay. But from whatever place it may come, the teak is a most valuable timber for all purposes that require strength, and especially for ship building. For

that purpose it is at least thus far superior to oak, that, while the tannin in the one tends to corrode iron bolts, there is a principle in the other by which they are preserved.

If universality of application, rapidity of growth and durability, are to be held as recommendations, probably the next Indian tree in value is a reed—the BAMBU (*bambusa arundinacea*). Probably that is the most rapid-growing of plants, as it will shoot up to the height of sixty feet in a single season; acquires a diameter of more than six inches at the base; is tough, strong, and firm, and at the same time light; answers for a vast number of useful domestic purposes, without any other dressing or preparation than being cut into lengths; and cases itself in an enamel of flint, which looks as handsome as most varnishes, and is more difficult to injure than any. In one year it attains its full height, and during the next, the wood consolidates. It begins to spring up after the ground has been completely saturated with rain, which is about the month of July; and reaches to its whole height by the time that the rains are over. When strength and compactness are wanted, it is customary at that time to cut off the tops, as, if that were not done, the centre would become very hollow by the exhaustion occasioned by the production of the flowering stem. When

the formation of that is prevented, the whole strength of the plant remains in the wood. Naturally, the bambû grows as straight as an arrow; but should it be wanted in any curve, that can be very easily obtained by bending it when young and soft, and retaining it in the bent position till it be matured. The bambû grows, and forms thick jungles in many parts of India: but, probably, there are no places where it grows more abundantly, and to a larger size, than at Goomsur, in the Circars, about sixty miles to the west of Juggernauth, and in the Western Ghauts, not far from Goa. In both those places it forms extensive and almost impenetrable forests. The bambûs grow as thick together as the stalks in a field of wheat, and as they are armed with sharp spines, which are tipped with the same silicious matter that makes the bark so hard, and are at the same time so tough and inflexible, and have the shoots from the joints interlaced like a piece of matting, that there is no way of making a passage through them, but by setting them on fire in the dry season. When the portion of the Circars where they are so abundant, was in the hands of the natives (and the people by whom it was possessed were as wild as their country), they used to erect fortifications of growing bambûs, which, unless burned, were nearly im-

pregnable. When the soil answers, it is hardly possible to imagine a more profitable crop than the bambû, the quantity of which that could be produced upon a single acre, in the course of two years, being greater than could be produced of any other kind of timber equally serviceable, upon ten times the surface in a dozen of years. The natural supply is, however, so great in India, that cultivation is a matter of minor importance. Bambû jungles are said to produce a very unwholesome effect upon the air, by stopping its circulation along the surface of the ground; and, whether that be or be not generally true, it is certain that Goomsur is one of the most unwholesome spots in the whole country.

Various species of the numerous and peculiar family of palms give a character to the scenery of India, and also furnish the inhabitants with many valuable products. Of these the one which ranks the foremost in general usefulness probably is—

THE COCOA-NUT TREE (*cocos nucifera*). The numerous and important uses of this tree have obtained for it a place in the mythology and important ceremonies of the Hindûs. When the virgins of the Hindû villages have performed their morning ablutions in the tank or reservoir appropriated to that purpose, they

go in procession to the temple of the village god, bearing, on bright brass plates, an oblation of the most fragrant flowers of the east, together with slices of the cocoa-nut, or entire nuts, according to their ability and the strength of their devotion. At most ceremonies, indeed, this sacred nut enters into the oblation; and upon the western coast, when the violence of the monsoon begins to abate, and the water may again be navigated with safety, the people cast each their slice of cocoa-nut upon the tide, to propitiate the spirit of the ocean.

According to their knowledge and habits, this is the only way in which they take to express their gratitude for the possession of a plant which is applicable to so many useful purposes.

A minute description of a fruit so well known as the cocoa-nut would be superfluous. The tree attains a considerable height in those places which are best suited for its growth; and it grows on those sandy soils which are not so well adapted for the culture of other useful vegetables. Like the rest of the palm family, the cocoa-nut tree is without branches; but the trunk consists of a tissue of remarkably tough fibres, that intersect each other like network, and thus the tree can bear those violent storms and hurricanes which are so frequent

on the Indian shores. The middle rib of the leaves is often twelve or fourteen feet long, and is very firm and strong. The leafets are very numerous, of considerable length, and very durable. These leafets are not only used for the manufacture of baskets, but are an important article in Hindû architecture, being plaited together to form the roofs and walls of houses, of which the trunks, when split, compose the beams and rafters.

The flowers come out at the roots of the leaves, in long sheaths, of which there is a considerable number upon a vigorous tree. When the flowers have nearly attained maturity, the sheaths open, the male flowers drop off, the germs begin to expand into nuts, and after these have attained a considerable size, the sheath also shrinks up. The fruit, when it approaches maturity, is very large, far larger than the nut which is imported into this country. It consists, externally, of a hard brown rind, which is very thin and tender; within that there is a great quantity of brown fibres. This fibrous matter, which is known by the name of *coire*, is of great use to the natives. When short, it is used for the same purposes as baked hair in this country, and cushions stuffed with it are very elastic. It is also spun into a cordage of a very superior quality; and there have been many instances of

vessels riding out storms securely by coire cables, when the best hempen ones, of European manufacture, have failed.

The use of the cocoa-nut shell as a vessel is well known in this country. It is one of the most firm and durable of vegetable substances, and requires very little preparation to make it fit for use. The pulp of the nut, though rather indigestible, when used alone, is a favourite ingredient in many Indian dishes. It also yields a great quantity of oil, which is used in India for the lamp, and for many other purposes.

In the southern part of India, where the temperature upon the low and sandy coasts that are best fitted for the growth of the cocoa-tree, is always sufficiently high, the tree has a constant succession of ripe fruit, and thus the produce of a little grove of those trees is very considerable. The trees, however, require some care: they must not be suffered to be choked up by the luxuriant vegetation which springs up in the places where they grow, always when the rain sets in, nor by the parasitical plants, which, fastening their germs and bulbs in the inequalities of the trunk, are apt to cover the tree with a foliage which is not its own, and which, were it allowed to remain, would drain the substance of the tree, and pre-

vent the ripening of the fruit. On low and favourable grounds the cocoa-nut tree begins to bear in four or five years after it is planted; but in higher situations it requires seven or eight years. A vigorous tree will yield as many as five hundred full grown nuts in the season; and the number of years that it will continue bearing is very great, greater, indeed, than has been ascertained, as a decayed tree of this description, arising merely from natural causes, is a very rare occurrence.

On the coasts of Malabar and Canara, those palms are so very abundant that there are supposed to be more than three millions of them in the former district alone. The uses that we have already mentioned, are but a few of those to which the natives apply them. They furnish a beverage, or rather two, a refreshing and an intoxicating one, and also a substitute for sugar; but those products are obtained from various palms besides that which bears the cocoa-nut. Those trees are remarkable for their quantity of juice, which may be drawn from the tree either when the young shoots that are to produce the flowers, have made their appearance, or by incisions into the wood, the fibrous network of which is full of liquid. The juice which is obtained (whether from this or from any other species of palm) is understood to be best if

drawn during the night, as the great heat of the sun, during the day, brings on the acetous fermentation, and converts it into vinegar. The juice thus obtained is called toddy by the English; and it becomes arrack, after it has undergone the vinous fermentation, and is then distilled;—when boiled down to a syrup, without fermentation, it is known by the name of jagary, and serves as a substitute for sugar, and also as an ingredient in a cement, which stands the weather.

The palms are, however, so very numerous in India, that the bare names of one or two more are all that we can find room to give. The great fan palm, which is not unfrequent upon the low and warm shores in the south, is the most majestic of the family; one leaf will afford shelter to a dozen of men, or entirely roof one side of a cottage. The smaller fan palm affords toddy, and so does the palmyra, or brab palm, the leaves of which are the substance on which writing is generally performed. The letters are first traced with a style or needle, without any ink; and the whole is afterwards smeared over with a pigment, which can be rubbed off from the general surface of the leaf, but which remains in the traces made by the style. Farther to the north, the palm which is most esteemed for the production of toddy, is the

wild date. Indeed in a country where shade and protection from the rain merely are required, it is difficult to imagine a description of tree better adapted for answering those purposes than the palm, which in the sap as in the fruit always yields some substance that contributes to the support of human life; while the form of the stem, the spread and the graceful curve of the leaves, render the palm one of the most elegant of nature's productions. Hence the nations, both of the east and of the west, have made it the emblem of power, victory, and immortality.

There are two other palms that demand a separate notice,—the sago, and the areca, or cabbage-palm. Neither of these is so common in India as the other palms; but the sago palm is valuable for the quantity of food that can be obtained from its stem, and the betel is one of the necessaries of life, at least of comfortable life in India. When split in pieces, and macerated in water, the wood of the sago palm gives out a great quantity of mucilage and farinaceous matter, which in some places is made into bread; and the areca, besides yielding an excellent, though expensive, pot-herb, in the young and tender shoots, supplies in the nuts, one ingredient in the betel, which is so generally chewed as a luxury by the Hindûs. For

this purpose, it is mixed with the leaf of the betel pepper, and sharpened with a little chunum, or quick lime. This palm does not grow generally in India, and it is not met with native and without culture, in almost any part of the country, with the exception of a portion of the west coast in Concan and Canara, and near the Tiperah hills to the north of Chittagong. The quantity of those nuts imported into the northern provinces is so great, that they form one of the leading articles of island trade in Hindûstan. The bare enumeration of the palms of India and their uses, would, however, occupy an entire volume; and of them all the wood, the fibres, the leaves, and the sap, or fruit, have their use in the domestic economy of the people.

The BABUL tree *(acacia Arabica)* is one of the most beautiful and useful in India. Its foliage of long and delicate leaves with a number of leafets pendant, and always green, is very beautiful; and nothing can be more pleasant than the odour of its flowers, which are yellow balls, made up of small filaments. The timber is much esteemed for purposes where lightness and strength are required; and by incision, the wood yields a gum, which, if not the same, answers nearly the same purpose as gum-arabic. When lands of moderate ele-

vation in the central parts of India, are neglected, and allowed to run wild, the babul is one of the most prevailing trees with which they are overrun; and nothing can be more beautiful and fragrant than some of the wilds in Gujerat, where the banks of pools and streams are at once adorned and perfumed by the babul.

There is another acacia which overruns the more elevated parts of the country; and which, though it does not always or often merit the epithet of tree, (seldom attaining more than twelve feet in height), is of considerable note, as producing the gum-resin, which is generally known by the name of *terra japonica*. The substance in question has no claim to either of those epithets, as it is a vegetable substance, and not an earth; and as the tree (*acacia catechu*) which produces it, grows abundantly in all the hilly parts of central India. It has also been said, that catechu is one of the ingredients which the people of India mix with the betel leaf and chunum; but that also is a mistake, as the only use to which they apply it is some purpose in dying, and as a salve for wounds. Like the gum of the babul tree, catechu is obtained from the wood, but not by exudation from the living tree. To extract the catechu, the wood is cut into short pieces,

and all the white wood on the outside of these carefully removed. The pieces are then boiled for a considerable time in water; and the extract is first evaporated in shallow vessels, and then dried in the sun. Catechu is a very powerful astringent, and would answer well for the tanning of leather, nearly one half of its weight consisting of tannin.

There are two species of pterocarpus found in India, which are much valued, the one for its gum and the other for its wood; these are the dragon's-blood tree, (*pterocarpus draco*), and the sandal-wood tree, (*pterocarpus santalinus*). The dragon's blood tree grows to the height of about twenty feet, generally on elevated situations. The gum-resin (which, however, is said to be produced also by several other trees) sometimes exudes naturally, when it appears in the shape of drops or tears, and is much more pure than that which is obtained in masses.

The sandal-wood is almost exclusively confined to the south-west of Mysore, just above the Ghauts, where it is extensively grown, and forms an important article of trade, both with Arabia and China, in both of which countries it is valued chiefly as a perfume; in Europe it is used chiefly as a dye, to communicate a red colour, or to deepen the common yellow dyes

to orange. For the ordinary purposes of commerce, it is ready at ten years' growth. At that age it is cut down, and divided into lengths, which are buried in the ground, in order that the sapwood may be destroyed by the white ants. That they very soon accomplish, without touching the red and perfumed wood in the interior; and when they have completed their labour, the valuable part is taken up, and is ready for sale. The tree is found on the Eastern Ghauts; but the soil there appears to be too thin for it, or the climate too dry, for it has very little colour or flavour.

One timber tree of India, though it does not attain a very great size, is valuable from growing upon the salt and sand plains of the Carnatic, where hardly any other tree will grow. That is the common bead-tree (*melia azaderach*). It consists of a number of straight and very slender shoots. Another is worthy of notice—a species of croton, upon the twigs of which, the *coccus lacca*, a small winged insect, forms the nidus for its young, of that substance called lac, or gum-lac, which is of so much use in the manufacture of varnishes.

Though the SPICES, or aromatic and pungent vegetables of India, cannot vie with those of the eastern archipelago, they are still valuable; and before those islands and the tropical parts

of America were known, they were the chief source whence the western world obtained its supply.

The *laurus cassia*, or cassia tree, of the Malabar coast, has some resemblance to the cinnamon of Ceylon; and the cassia, under the name of Malabar cinnamon, is sometimes sold for the more valuable product of the island. It is thick and coarse, compared with the true cinnamon, and very inferior to it in flavour.

The *pepper vine* is found native in some places of India, more especially in the Circars; and it has been extensively introduced into culture. Many of the forests on the Western Ghauts produce it very abundantly, without any culture, and there are places where the culture is largely and profitably carried on. In the rich lands on the Malabar coast, pepper forms in many places the chief article raised for exportation. The culture is rather expensive while the trees are young, as they then require to be carefully watered; but the land has the advantage of affording two crops at the same time, one from the pepper vines, and another from the jacca trees on which the vines are supported. The vines are raised by planting slips, which as they shoot up are trained to the stems of the jacca trees; they come into bearing at the age of three or four years; and the average

produce of each vine may be about five pounds of pepper in the year.

But of all the pungent plants of India, the favourite with the native is the BETEL, (*piper betel*), which they chew along with their areca-nut and lime. The district where that is produced in the greatest abundance, and of the finest quality, is on the east side of the Minga river, (the mouth of the Brahmapootra), between the Tiperah hills and the north-east part of the Bay of Bengal. From this district, and the other moist and fertile ones, on the eastern branch of the Lower Ganges, a great deal is sent, not only to Hindûstan, but to the countries to the east.

Another plant, which yields aromatic seeds, is the cardamom palm, (*elettoria cardamomum*), which grows in nearly the same parts of the country that produce the black pepper, and flourishes best in shady places. The plant is about ten or twelve feet in height; and the grains called cardamoms are the seeds. This plant is, strictly speaking, a reed, and nearly allied to the ginger and turmeric, both of which grow in the same country.

The FRUITS of India are numerous, of excellent quality, and, though perhaps none of them are now peculiar to India, there are many which were originally obtained from that country;

and it has been already observed that the better fruits of Europe may have come originally from the south side of the Hindû Cosh, and the Himalaya. All that we can mention must be merely a specimen, and these shall be taken from those that are generally said to be most characteristic of India. It may, however, be remarked, in passing, that, in consequence of the warmth of its plains and valleys, India is calculated to produce in cultivation all the fruits of the tropical regions; while the elevation of its mountains, and the consequent rigour of their climate, give it a range as wide as to take in the produce of Lapland itself.

Of those fruits which we may reckon peculiar to India, and found abundantly to the westward of the Bay of Bengal, perhaps the most delicious is the MANGO (*mangifera Indica*). Like the cocoa-nut, the mango finds a place in the mythology of the Hindûs; and the tree is represented as growing out of, and overshadowing the head of the goddess Indrance, in the excavated temple of Indra, at Ellora. The mango is very widely diffused over India, and found, both in a wild and in a cultivated state, from the hills of Sirhind, on the north-west of Delhi, to the southmost point of the peninsula. As is the case with many of the other fruits, it is said to be better on the west coast of the peninsula

than on the east, till the humid districts on the east of Bengal are arrived at. Travellers say that the finest are produced in the Mazagory district, near Bombay; that the parent tree there is guarded by an armed band, when the fruit is ripe; and that during the reign of Shah Jehan, the father of Aurungzebe, about the middle of the seventeenth century, carriers were placed at stations all the way from this coast to Delhi, in order that the mangoes of Concan might be enjoyed in perfection, as the finest vegetable dainty at the imperial table.

The mango is a very beautiful tree, having in its general habit some resemblance to the walnut, only the leaves are more gracefully formed. The flowers, which are small, whitish, and have each five lancet-shaped petals, grow in large pyramidal bunches. They are followed by clusters of fruit, which are slightly kidney shaped, and about the size of an ordinary pear. The fruit, when ripe, varies much in colour, there being upon the same tree all shades, from apple-green to a bright golden orange, having the one side marked with glowing crimson. In the eastern islands the mango attains a weight of two pounds, though it is never so large even in the most favourable places of India. The skin of the mango is thin and smooth; and underneath that there is a flesh or pulp, rather

firm to appearance, but which is far more cooling and delicious in the flavour than any peach. It is difficult to imagine a finer fruit, and it has the advantage of being very productive. Until the close of the Burmese war, and the territory which the events of that war put the British in possession, the mango was the finest fruit in British India, and it had no equal in any of the intermediate countries.

Since, however, the country of Tavoy, on the east side of the Bay of Bengal, has been added to the possessions of the Company, the mangosteen and the durion may be reckoned among the number of fruits in British India. Neither of these fruits, or, so far as we know, the plant upon which it is produced, has ever been raised in Europe, even as a curiosity; and the fruits will not come to maturity in India, west of the Bay of Bengal, where, it seems, the protracted drought and the violence of the monsoons are not suited to their habits. The situation of Tavoy and Mergui resembles much more that of the eastern isles, and there we accordingly find those dainties of the vegetable kingdom that have hitherto been supposed to be confined to them.

The MANGOSTEEN (*garcinia mangostana*) is, to the senses of a European, the most delicious fruit that grows. The tree is also a most ornamental one. It rises to the height of

about twenty feet; and the arrangement of the branches gives to the top of it the outline of a parabolic conaid, which, as it is the form assumed by the jet of a fountain, seems at once the most stable and the most graceful of figures. The leaves are large, and of a beautiful colour; and, in their arrangement, as well as in the flower, there is some resemblance to the habit of the camellia japonica, only the whole is more majestic. The leaves are at least eight inches long, and four in breadth at the middle; the flowers are produced at the terminations of the shoots, and resemble single roses, with their petals of a fine dark red.

The fruit is spherical, but compressed a little at the root, where it is embraced by a calyx of four petals, and at the crown, where there is a cape consisting of six rays. When ripe the fruit is about the size of an ordinary orange, and of a fine brown colour, dappled with yellow. The rind is about the thickness of that of an orange; and thin membranes divide the interior into six cells, in which the seeds are contained. Those cells also contain the pulp, the flavour of which all who have tasted agree in admiring, as the highest gratification of the palate, though no two of them be quite agreed as to what it most nearly resembles. The flavour of the

grape and that of the strawberry are contained in it, while it has a peculiar pungency, to which perhaps camphor, in very small quantity, probably bears as near a resemblance as any thing with which Europeans are familiar, and it leaves a sense of coolness upon the palate, which, under the burning sky of those regions, is peculiarly pleasant. "I and my companions," says Abel, a competent judge, "were anxious to carry with us some precise expression of its flavour; but, after satisfying ourselves that it participated of the compound nature of the pine-apple and the peach, we were obliged to confess that it had many other equally good but utterly inexpressible flavours." The mangosteen is found both cultivated and wild; and the latter is said to be, in some situations, not inferior to the former. The mangosteen has not hitherto been transported out of its native country, though, from the resemblance of its rind to that of the orange, or rather that of the pomegranate, there is a possibility that it could, if taken before it were altogether ripe, be removed to a distance; and thus, as it has been found in the British possessions on the east side of the Bay of Bengal, it may find its way to the shores of India, and ultimately to those of Europe.

The DURION (*durio zebethinus*) is a sin-

gular fruit. It is both worse and better than the mangosteen—worse, in respect of its appearance, being externally rough and unpromising in the extreme, and of its odour, which is particularly rank and offensive. Putrid eggs and onions, the washings of a gun,—all sorts of smells, that are more than usually rank and offensive, have been cited as illustrations of the odour of the durion; and, to complete the parallel, the fruit itself becomes sooner putrid than almost any other vegetable with which we are acquainted—twenty-four hours after being pulled it begins to rot, in which state it is more offensive to the olfactory nerves than ever. Still, when the Tavoy district was in the hands of the Burmese, the durion was carried thence to Amarapoora, the capital, a distance of more than six hundred miles, as a chosen luxury for the sovereign, though it must have then been in a state of decay.

And those who have tasted the durion confess, that the wholesomeness, the exquisite flavour, and the nutritious qualities of the fruit, soon made them forget the odour of the fruit itself, and that which it communicates to the breath. The exquisite part of the fruit is a pulp, of a pure white colour, and about the consistency of cream, in which, odour excepted, the very choicest qualities of animal and vegetable ali-

ment—of the most nutritious food, and the most cooling drink, are so blended together, that it is difficult to say which predominates; and all the arts of cookery would be exerted in vain to produce an imitation of the durion. It is turtle and champaign, capon and iced pine, all blended together, with some unknown ingredient added, which not only gives a zest but a medicinal virtue to the whole. The durion, different from almost all delicious viands, never palls upon the appetite; and, instead of injuring the digestion, it restores the tone of disordered stomachs.

The tree which produces this choice and singular fruit is not, in habit, unlike a pear-tree, only the leaves, which are entire at the edges, more resemble in shape those of the cherry. The flowers are large, contain a number of filaments, and are of a yellowish colour. When young the fruit is not unlike the chesnut in appearance, only it is covered with pointed scales, instead of spines. As it swells it attains the size of a man's head; and but that the tubercles have still the appearance of pointed scales, it has a considerable resemblance to the bread-fruit. When it is allowed to remain too long upon the tree, the scaly crust bursts at the crown, the pulp putrifies, and the seeds drop to the ground. Those seeds are contained in

four cells, in each of which there is usually several seeds, and these are embedded in the pulp. Those seeds, when roasted, may be eaten; but they have none of the exquisite qualities of the pulp in which they are embedded. They have some resemblance to chesnuts; but they have also a peculiar flavour, intermediate between turpentine and camphor; and though they have not the delicious taste of the pulp, they have the repelling odour. It is by no means improbable that those who have given such very unfavourable accounts of the durion, have judged of it only from the seeds.

The BREAD-FRUIT, in both the species, is found in India: those species are the true bread-fruit (*artocarpus incisa*), and the jacca, or jack fruit (*artocarpus integrifolia*). The first has the leaves divided into lobes, and the latter has them entire, as the names import.

The bread-fruit, as is the case with some of the other showy productions of the tropical countries, which, though they yield but a very coarse food, are attractive, and, therefore sought after by men in the early stages of society, appears to have acquired a celebrity to which its qualities do not entitle it. It is not very much relished in India, though both it and its compeer the jacca, which grows more freely in that country, may be eaten. It is not, however,

deemed worthy of a place in the culture of a country where so much labour is required, unless where the trees are made use of to support pepper, or some other more valuable crop. The experiment of introducing it into the West Indies has, notwithstanding all the labour and peril at which it was effected, turned out to be little better than a failure; and one cannot help looking upon it as, in fact, a parallel case with the attempts that are occasionally made, even at this day, to foist the coarse and husky Indian corn upon the simple of this country, as a substitute for the ordinary grain, even though, besides its comparative worthlessness, it be not adapted to the climate, and the proper ripening of it must be accidental more than any thing else. It is a remarkable fact in the history of cultivation that, notwithstanding the differences of climate, the more civilized have never borrowed much from those that have been less so. The potato is understood to have been brought from the table land of Mexico, or the plains of the Andes; but there is no trace of our having got it from the natives; neither has there been the smallest wish in Europe to introduce into culture the cassava *(jatropha manihot)*, from which the natives of that part of the world derive their bread, such as it is.

The BANANA, or the PLANTAIN, is a more eligible fruit for Indian culture, though, in point of quality, they (or that, for it is not absolutely settled by the schoolmen whether they be the same or not) have apparently been overpraised.

The banana (including under that name both of the species or varieties) is, however, one of the most productive of vegetable substances. It has a sort of perennial creeping root, and the fruit is produced upon annual stems, which rise to the height of fifteen or twenty feet. These throw out at the top a plume of very large leaves, at least six feet long, and two in width, with a very strong rib in the middle; but the rest of the leaf, which consists of straight fibres issuing from the mid-rib at nearly right angles, are easily torn, even by the wind. The spike of flowers issues from the centre of the leaves, inclosed in a sheath, after the manner of the palms, and attains a height of four or five feet. The fruits are very numerous, and sweetish, but rather insipid. The fruits ripen in about eleven months after the sucker of the banana is planted; and if the stalks upon which the fruits have ripened be cut down, the suckers soon bear again. A single stalk produces more than one hundred and fifty bananas, and each, upon an average, weighs nearly half a pound. Each

stalk requires a square of about five feet in the side; so that an acre would produce more than eighty thousand pounds of bananas. The banana is said to be of better quality in India than in tropical America, though, in the latter, it is probably much more productive, and certainly forms a much greater portion of the subsistence of the people.

The TAMARIND is, in its leaf, its pod, and its general habit, a good deal similar to the acacia tribe, though it be very different in its botanical characters. It grows readily on the slopes and at the bottom of the Western Ghauts, in those places where the salt water does not come; and though, perhaps, the pods are not quite so succulent as those in the West Indies, they are much larger, and the acid juice is an important addition to the other fruits of the country.

But of the fruits of India, indigenous and imported, (and the country has been so often visited by foreigners, that it is not easy to say what is really indigenous, and what not,) there is absolutely no end. The pine-apple, the guana, the orange family (of which those produced in the Silhet district of Bengal, are excellent); the papaw, with its habit something like the palm, and its fruit as large as a moderately-sized melon; the Otaheite apple; the

pillaw, with its bags of nuts, each bag weighing more than twenty pounds; the carambole, with its juicy berries, resembling those of the grape; and, in short, almost every tropical fruit that can be named, may be met with in India.

Of fruits that have been domesticated in Europe, the most abundant are the grape, the fig, and the mulberry, though plums and apples are also met with; and, as the mountains are ascended, almost every variety of fruit that is found in the coldest parts of the northern hemisphere. We must, however, close our notice of the natural garden of India, (and much of it is a natural garden); and we feel that we cannot do better than close it by the following quotation from Aikin:—"The *hibiscus ficulneus* is remarkable by its magnitude, and the profusion of its elegant blossoms, and is of peculiar value in a tropical climate, as hardly any insects are found under its shade. The cotton tree rises with a thorny trunk, eighteen feet in circumference, to the height of fifty feet without a branch; it then throws out numerous boughs, which are adorned, in the rainy season, with purple blossoms, as large as the open hand, and these are surrounded by capsula, filled with a fine kind of cotton. The *nyctanthes hirsuta*, and the *jas-*

minum grandiflorum, boast of the most fragrant blossoms of the whole East, the former perfuming the night, and the latter scenting the day. The *gloriosa superba*, and Indian vine, form, by their union, bowers worthy of Paradise."

The cultivated vegetables of India, that form the wealth of the country, will be noticed with more propriety when we come to speak of the modes of their culture. But, in the mean time, we may observe, that they are in no country more numerous, in each of the two important divisions of supplying food, clothing and substances available in the arts.

Besides rice, millet, and the grains of Europe, with varieties that are not known in European culture, the number of podded plants, which might be called beans, peas, and vetches, which the Indians cultivate for food, are very numerous; and the whole find sustenance for the immense population, at a much cheaper rate than the people are fed by the produce of artificial culture in any other country.

Of the plants which are reared for clothing, the cotton claims the first place, as the universal covering of the great body of the people, and as having been celebrated for the perfection which it had arrived at, at a very early age. Next, perhaps, may be ranked the mulberry

tree, which, though it does not immediately produce the silk of India, yet is the chief food of the insects by which that substance is formed. Flax and hemp are both grown in India; but where cotton is so abundant, so much better adapted to the climate, and so well manufactured, these are to be considered rather as plants cultivated for the other products that they yield, such as oil from both, and an intoxicating liquor from the hemp, than as materials for clothing. Even for cordage, hemp is not very much used by the natives of India, as the *coire*, or fibres, of the cocoa-nut, are obtained with less labour, and are more durable. In times when the ports of the Baltic have been shut against this country, the *sunn* hemp of India has, however, been found to be both a cheap and a valuable article of import. Its great length renders it not well fitted for being spun by machinery, the grand source of modern cheapness in the hemp and linen manufactures of Britain; but it is very strong, and of no inconsiderable value.

Of the substances afforded by the plants of India, perhaps, the most valuable are the oils. They would be valuable in any country; but they are peculiarly valuable among a people, the prejudices of whose religion prevent them from availing themselves of the tallow of cattle.

One of the most valuable sources of vegetable oil is the sweet *ponna* tree (*calophyllum inophyllum*), which is a stately forest tree, attaining an elevation of nearly one hundred feet, and a diameter of more than three. It is also a beautiful tree, and the flowers have an agreeable scent. Wherever the ponna tree is found, the common lamp oil of the country is manufactured from the seeds. The place where it is obtained in the greatest abundance is on the Malabar coast—that garden of the choicest botany, more especially of the trees of India. When the ponna is not met with, there is a substitute in the common castor-oil tree (*ricinus communis*), which is more generally diffused over the country, being found on the table land of Mysore, and also in many parts of the Valley of the Ganges. When the castor-oil tree fails, in consequence of the increased cold of the climate, there are still substitutes. Upon the hills which separate the Kumaon district of Delhi from the low ground, there grows a tree, which supplies a thick oil, having the consistency of tallow, or lard, and which answers for burning. This tree, which the natives call *phutwarrah*, grows to a considerable size, attaining a height of fifty feet, and a diameter of two. It produces abundance of nuts; and it is from the kernels of these nuts,

that the fatty substance is obtained. Wherever the pine is found, it abounds with turpentine; and though that be not extracted for any useful purpose, the timber is, generally speaking, straight and durable; and the part toward the pith, highly inflammable. It is rather a singular coincidence, that the candle of the peasantry on the hills to the south of Cachmere, and that of those of some parts of the high lands of Scotland and of Ireland should be the same—namely, a slip of the central part of a pine; and the only thing wanting to render the coincidence perfect, is, that the candle of the Scots and the Irish is ancient, and dug out of the bog, while that of the Indian is recent. The herbaceous oil plants, such as flax and mustard, as well as those that are raised for the sake of more pungent or aromatic oils, fall more naturally within the description of Hindû industry.

The same is the case with many of the drugs and dye-stuffs. We have already mentioned some of the gums, and incidentally also the opium, and cardamoms, which are used in the *materia medica*, as well as in the culinary art. Of the vegetable substances, from which dyes are procured, by far the most valuable are the madder and indigo plants; and both of them form exclusive articles both of cultivation and of commerce.

What has been stated in this chapter has no pretensions to be considered as even a list of the vegetables of India: it is merely a specimen, from which those who have not studied the subject, may form some idea of the capabilities of India, as a forest, a field, an orchard, and a garden; and that, taken in combination with what has been sketched in the former chapters, may, perhaps, prove another step in the process by which the general value of the country may be estimated, with due regard to truth, brevity, and perspicuity.

CHAPTER XI.

ZOOLOGY.

TIGER AND ELEPHANT.

THE animals of India, though very numerous, and many of them of the most interesting classes, have been so often and so minutely described, both in their individual

characters, and accompanied by the scenery in which they have their natural habitations, that little more will be demanded of us than a line or two, more for the purpose of completing the physical sketch of the country, than for any specific information that we can, in the brief space to which we must confine the subject, be supposed to convey.

The paucity of animal remains in the soil of India, has already been noticed; and the permanent nature of the country, free as it seems always to have been from the action of volcanoes, together with the decomposing powers of the atmosphere, have been hinted at as the grounds upon which this want of animal remains may be most satisfactorily accounted for. But, if we had space in which to follow up the subject, we should find in this absence of organic relics in India, some light thrown upon their occurrence in other parts of the world. If the deposits of those remains that we meet with in so many other countries, had been made by any general convulsion which had affected the whole globe, or anterior to any general formation of strata upon its surface, it is by no means easy to see how India should have escaped; or why, when other countries exhibit so many traces of having undergone partial revolutions since they were the habita-

tions of animal life, and so many kinds of strata, which, as the scorner says, embroil theorists in a mental contest as to whether the several countries have been "roasted or boiled for the use of their inhabitants,"—the greater part of India should show nothing but the granitic formation, and those schistose strata, which are generally held to be the first decompositions of granite. As India is formed of what they term the first or primitive rock, there is no possibility of supposing that it is, as a country, in its general form, younger than any other part either of the eastern or the western continent. When we look at the granite table land south of the Krishna, and especially when we look at the vast ridge of the Himalaya, we are constrained to admit that these could not have been raised from the bed of the ocean at any time when the earth was inhabited by human beings, without all its inhabitants knowing and remembering the fact. If at an event comparatively so trifling as an eruption of Etna, or an earthquake at Lisbon or Calabria, the earth shook for nearly a quarter of its circumference, we may be well assured, that Mont Blanc and Chimboraço would have fallen flat had they been called upon to witness the uplifting of Mysore, and the birth of Dhawalagiri. But we cannot enter upon the train

which would lead from hence, curious and inviting though it be. Our business is with the animal life of India, such as we find it existing. In passing, we cannot, however, avoid noticing one peculiarity in the zoology of India,—or, if there is a parallel case, it is found only in Southern Africa :—India and Southern Africa (the last in an especial matter) chronicle upon their fronts as deep and decisive existence of the ravages of time, as any other region on the face of the earth. The debris in the Valley of the Ganges, the desert on the south of the Sutledj, the naked rocks of the table lands, the deep beds of the Godavery and the Krishna, and the ruins of the primitive strata upon the low land of the Carnatic, all tend to prove that India cannot be younger than Europe or Siberia. As for Southern Africa, again, it is the very type of ruin; the rocks are everywhere laid bare, and the rivers have cleft the earth almost to the level of the sea. Volcano there is none, either in the one country or in the other; the internal powers of the earth appear in both to be exhausted, and the surface is left to the mercy of the elements,—to the burning drought and the pelting rain of two extreme seasons, which, as it were, war with the earth and with each other.

Here a curious question arises in the natural history of those regions; although it be one of which we cannot, for obvious reasons, (perhaps the most obvious reason to the reader will be our want of ability,) pause to discuss. But those who affect to be learned in the natural history of the earth, would do well to tell us, why India and Southern Africa have still their elephant and their rhinoceros, while those of the north of Asia, Europe, and America, are in their graves, and have been so from the earliest, aye, and before the earliest period of history? If we were to judge from circumstances, and from that judgment infer that different parts of the land have been formed at different times, we should be inclined to reckon Africa and India the elder born; and yet a species of living creature, apparently the most durable that nature has formed, remains in these, and has, from beyond the date of human memory, been extinct in the other. The bones, the entire animal preserved in ice, prevent any doubt about the fact; and those remains show that they belonged to a race, more amply furnished with the means of defence and duration than the elephant of India or Africa. The tusks of the extinct elephant (*elephas primigenius*), which still form an article in the commerce of Siberia, are larger than those of the living

species; the grinders are also more powerful; and though the skeleton does not indicate greater length or height, it affords evidence of a thicker built, and, therefore, a stronger animal. Yet this stronger animal has perished in countries that have, for a long time, been in a state of progressive improvement; while the weaker remain where the elements display all their fury, and man, to have fertile fields, must wage continual war with the desert.

To give a description of the elephant would seem superfluous: man has been familiar with it from the remotest times; it has been the auxiliary of armies, the pride of princes, the servant of merchants, and one of the chief attractions of every menagerie. All sorts of persons, from the sage to the showman, have thus combined to set forth the appearance, the magnitude, and the sagacity, of the elephant, till, if the brute that roams the thick forests of India could it read, it would really not know its own history. From so many and so interested and ignorant sources, it would be vain to expect any thing either very true or very consistent; and probably the most wild and wretched romance in the circulating library is not a more wide caricature of human nature, than the majority of written accounts are of the elephant.

As the elephant is the largest, and, estimating

him as a mass in motion, the most powerful of land animals, there has been a great tendency to endow him with those superior attributes, which fancy, without regard to the facts, is so very apt to associate with mere magnitude. He has been styled the wisest and the most lofty-spirited of brutes, and his reasoning powers have been stated as more than matter of imputation. As to the reasoning, one fact is decisive: the elephants of the present day have no more understanding than they had in the time of Darius. As for the independence, again, it has just as little foundation: the elephant is at first tamed by fear and starvation; and his motions are directed by an iron hook, which his driver thrusts into his forehead to push him on, and into his ear to turn him aside. The story of their not breeding in confinement, from delicacy or haughtiness, or any other intellectual cause, is not true, as they have bred in that state both in ancient and modern times; and the cause of their doing it so seldom is physical—they are not sufficiently fed, and too hard worked. Even what is told of a sexual paroxysm taking place at a particular season annually, in male elephants, is not true; for in their native forests the elephants breed at all seasons; and it has been ascertained that the period of gestation

in the female is about twenty months and a half. The age to which they live has not been fully ascertained; but there is reason to believe that it is not less than two hundred years. According to the observations that have been made, the maternal feelings of the elephant are very blunt.

But although the elephant,—when its history is divested of those fabulous exaggerations which have been heaped upon all the productions and phenomena of nature, and which still remain in those places where the pruning-knife of geometry, which has cleared the heavens of astrology, cannot be applied to the lopping of them off,—is not that miracle of wisdom which the multitude believe, it is still a very curious animal, and important both for its nature and its uses.

Living in forests where an animal of less volume and power could hardly make its way, and would not be safe from the carnivorous beasts with which those forests abound, the elephant is admirably fitted for its residence.

The form and covering of the elephant, are well fitted for enabling it to make its way through jungles and forests. Its head forms a battering ram; and in order that the brain may not suffer pain from the concussion, the frontal sinuses are extended to two large cavities. The projections formed by those cavities, are probably one of the causes of that imaginary wisdom

which is imputed to the elephant, as they lead those who are not acquainted with its structure, to suppose that the cerebral mass is anteriorly very much developed. But the " sagacious facial line" has nothing to do with the brain of the elephant, that organ being remarkably small, not more than one twenty-third of that of the human subject, in proportion to the weight of both. And yet the senses of the animal are wonderfully acute. Of the sense of taste in animals, we know less than of any of the others; but the great partiality of the elephant for sugar canes, for the sake of which it leaves the forest, and ravages the cultivated fields, and its fondness for sweet things, show that it has a power of election in its eating. The sense of sight is very quick, though, from the position of the eyes, and the shortness and stiffness of the neck, it is limited in its range backwards, except near the ground. It sees the rider, or the load upon it, with difficulty, if at all. Its hearing is very acute, and thus it has a very great discrimination of sounds; and there have been instances of one once domesticated escaping, being taken again in the usual manner, and at once obeying its old keeper, though till then it had given no sign of ever having been in human training, or having the least knowledge of the snare in which it had been formerly caught. Indeed the prin-

cipal sagacity of the elephant seems to depend upon the power of following a certain sound with a certain act. An elephant, which was, some years ago, butchered in London, probably in consequence of ignorance on the part of those about it, listened to the voice of its keeper, even when it had been irritated and mortally wounded.

The sense of smell is very wonderful, and is no doubt the one by which the course of the animal is chiefly guided in those places where sight would be useless, 'and hearing of little more avail, on account of the rustling that itself must make. Thick as the hide of the elephant is, it is far from invulnerable. The insects of the jungles give it a great deal of annoyance, and put it to many shifts in order to get rid of them. Indeed, when left to itself, and where it has plenty of food and water, the hide of the elephant is soft; and it is dry and chapped in confinement, only because the animal does not get proper food, or enough of exercise to promote digestion. With the exception of the human hand, and the express organs of feeling in animals that have to grope for their way and their food, there are few organs in nature in which the sense of touch appears to be more acute and delicate than in the trunk of the ele-

phant, especially in that part of it which serves as a hand.

That organ is indeed the most singular part of the animal, and though, to those who are not in the habit of seeing elephants, or thinking on their native haunts and habits, it seems not a little uncouth; it is, to use an expression which is, perhaps, not very admissible, one of the most ingenious instruments in animal mechanics. Before we see it used, we are very apt to imagine that a cartilaginous tube is not the most promising tool of all work; and we would be very apt to propose a number of substitutes; but when we have seen it used, we would cast them all aside as inferior, and give the trunk back again.

The number of uses to which it can be applied is truly astonishing. It is a hand, of almost any power or grasp. It can pick up the smallest blade of grass, or it can rend off a large branch of a tree. It can even serve as two hands, a coil holding down the branch, and the forceps at the point pulling the leaves or the fruit. It can mow the short herbage like a scythe, and collecting the swathe, convey it in a bundle to the mouth; and it can pull the larger herbage by the roots, wash them in a stream, or beat the mud from them against the fore legs. Thus, in consequence of its being universal joint,

while hands and paws have joints only here and there, it can find its way through an opening of contrary flexures. It can draw water from a depth, and either convey it to the mouth, or wash the whole body with it. In this last operation, and also in smearing the skin over with wet mud, it is of great service against the insects. It can spout water, and also throw substances to a considerable distance, and is also used as a blow-pipe, and as an organ of sound. Standing firmly upon its legs, the elephant can command with its trunk a greater portion of surrounding space, and command it all more equally, than any other animal; and perhaps the elephant is the only animal that can act powerfully and over a considerable circle.

In the elephant, more especially in that variety which, in India, is denominated the Kûmareah, or princely species, the tusks form powerful weapons of defence. These project forward, and have a curvature upwards, while some of the other varieties have them short, and pointed down. The tusks of these are not nearly so large, however, or so fine ivory, as those of the African elephant, and they again are not so large as those of the extinct species. However the elephants of India may differ in their size, colour, and the form of their tusks, they appear to be all of the same species; and

to differ from the African ones in having the transverse ridges of enamel in the teeth smaller and more numerous, and a toe more upon each foot. The African elephant has four on the fore foot, and three on the hind; that of India has five and four. There is a remarkable instance of the economy of nature in the teeth of the elephant; the tusks are shed only once, on an average, about fifteen months after they are born; but the grinders, the only other teeth, are renewed many times, as necessity may require;—the hard food upon which the animals subsist, and the great quantity that they must masticate, wear away the surfaces of the teeth; and they are supplied by others that grow farther backward in the jaw, and are pushed forward when the fangs of those that are no longer serviceable are absorbed. This renovation, probably, takes place a dozen of times in the course of a long life; and though old elephants get stiff in the joints, there are no accounts of failure in their powers of mastication.

Notwithstanding its great strength, and the formidable weapons with which nature has furnished it, the elephant is a harmless, and even a retiring animal; and, unless when alarmed for its own safety, it wages war upon no other living creature. The extensive and thick forests are its chief abode; and the places

of India where it is most abundant are the moist forests in the south-east of Bengal, and some parts of the western Ghauts; but more especially the former. The forests on the Tipera hills, on the south of the Silhet district, have long been the place where the principal continental supply of elephants has been obtained; and there they are still numerous, being found in herds of about a hundred in number. They are, like many of the other animals that live entirely upon vegetables, gregarious; and the herd are generally found to follow the oldest pair as leaders, and to go readily wherever they lead the way. In their marches through those forests, tangled as they are with underwood, sight would be of little avail; and therefore their means of communication are scent and sound. Food, friends, and foes, appear to be detected with great certainty, and at a considerable distance by the former; and the latter also admits of considerable variety. An elephant has three cries. The one is rather clear and shrill—a trumpet note, produced wholly by the trunk, and emitted when the animal is in good humour, and all is safe. The second is a growl or groan, issuing from the mouth, and is the cry of hunger, or an intimation to the rest when one has come upon an abundant supply of food; the third sound is

loud as the roaring of the lion; and is the war cry by which the animal prefaces his own hostilities, or calls his associates to his aid. They are seldom found far from each other, unless in the case of males that are expatriated, as is the case with deer and some other animals; and those often quit the forest, and are caught by using three or four tame females as a decoy. Even alone, in these cases, the beasts of prey—even the tiger, notwithstanding his agility and strength—will hardly venture to attack the elephant. The male receives him on his tusks, tosses him into the air, and stands prepared to stamp his fatal foot upon him, the instant that he touches the ground. The female elephant has no tusks upon which to receive an enemy; but she has the art to fall upon him, and crush him by her weight.

In their native forests, where they are in herds, the elephants are invincible to all enemies, but man. If one gives an alarm, others hasten to the spot, and where they act in concert, the carnivorous animals keep their distance. In those places man is the only inhabitant of the earth by whom they can be subdued; and he owes his superiority chiefly to an element which the lower animals have never been able to engage in their service. Man, even in his most savage and uncultivated state, rubs one piece of

wood against another, till one or both be ignited; he applies the match, so lighted, to a bundle of sticks, or to the reeds, brushwood, or grass, and the stoutest and most daring animals own his sway and shrink from this the symbol of his dominion. When we reflect on the power and the security which this single and simple operation of the lighting of a fire gives to man in those parts of the world that are infested by ferocious animals, we cannot help being struck at the vast superiority which the possession, even of the lowest degree of reason, has over the perfection of mere animal courage and strength.

What means were used by the ancients for the capture of elephants, we are not informed; but the method now practised is not a little curious; and, probably, it is the same that has been employed, upon a great scale, from time immemorial. A *keddah*, or trap, is formed in some place near to the forest which is the haunt of the elephants. This usually consists of three inclosures: the first of them is of considerable dimensions; the second smaller; and the third leads to a passage so narrow as that a large elephant cannot turn round in it; and they are all very strongly formed of stakes and beams; and the large ones, except at the entrances, are fortified by deep ditches. Those ditches are on

the inside, and the earth which is dug out of them forms a high bank, upon the top of which are the palisadoes. The principal entrance is so formed that it seems merely an opening through the bushes—a passage by which the huge animals may escape from that annoyance, by which they are driven into captivity.

To get the elephants into this keddah is a matter of nice management, as well on account of their power as of their timidity, and the acuteness of their hearing and smell. Men who are familiar with the forests, and know their haunts, are employed to find them out; and that being done, the herd is surrounded with a cordon of pickets, who open communications with each other, and keep fires constantly burning. As soon as the herd is surrounded, another inclosure is formed in advance toward the keddah. It is made smaller than the first, and formed only to a semicircle; and when that is done, the former pickets open out to both sides, till the two inclosures are united. The next step is to bring up the rear of the first inclosure, which is done by beating drums, shouting, waving fire-brands, and every other means by which animals that are so retiring as the elephant can be annoyed. Care must be taken, however, that the herd is not alarmed; for were that the case, it would dash through the

cordon, and not merely escape, but be fatal to the pickets. It is, therefore, urged on so gently as that it merely moves away from the noise, but continues to browse the leaves and twigs as it moves along. In this slow and cautious manner the elephants are brought forward till the entrance of the keddah forms part of the circle. When they are brought there, the noise toward the rear is redoubled, and the motion of the whole accelerated, till the leaders of the herd enter into the opening, which they do with some caution; but the moment that they have done it, they are followed by all the rest, upon which the opening is strongly barricadoed, and fortified on the outside by a line of fire, which is also extended along the greater part of the inclosure, excepting towards the second one, that being the direction in which the herd is intended to be driven.

In passing them from this inclosure to the next one, it is necessary to use expedition, as they generally presume that there is danger, and sometimes break through every thing and escape. Accordingly, a constant display of noise, fire, and smoke, is kept up, by voices, drums, guns, flaming and crackling branches of green bamboos, and every device that can increase the effect. The animals take several turns round the first inclosure, with a view of

escaping; but they are assailed at every point with demonstrations of fire, by which they are at length driven into the second inclosure, and that is shut upon them in the same way, and guarded by the same means. Around that the noise is redoubled, in order to urge them on to the third.

As that is usually much smaller than the others, and presents no opening by which they may escape, even to another place of confinement, the animals now find that they are completely in the snare, and their indignation knows no bounds. Their roarings drown the clamour by which they are surrounded, and they rush toward the ditch and the palisadoes in all directions, with so much impetus and fury, that hardly any contrivance of man would appear able to resist them. The people are, however, upon the alert, and their assault is stopped by the great enemy, fire. The contest is carried on till the animals are completely fatigued, and have recourse to a tank, or drain of water, which is prepared for the purpose in order to quench their thirst and lave their throbbing sides, which latter operation they perform by squirting the water all over them with their trunks. But, though exhausted, they are not yet subdued; they growl and threaten, and often attempt to escape; but the fire and the

clamour meet them whenever they approach the fence, and they subside into a sullen humour.

Their hunger is now worked upon; and though some food be given them, they may be considered as tantalized rather than fed. When they have been kept in this manner for a greater or less number of days, according to the humour which they evince, the bars that close up the narrow passage are withdrawn; food is thrown in by some men on a scaffold over the opening, and one of the elephants is tempted to enter. The door closes behind him, is instantly barricadoed against him, and there is no return. He cannot advance far, in consequence of bars that are put across a little in front of him, and he cannot turn round. He, therefore, tries the battering-ram—first, backwards, against the gate, in order that he may join his brethren; and then forward, against the bars. But as an elephant once brought thus far is reckoned a prize, and as it is known that the efforts which he will make for the regaining of his liberty will be pretty much in proportion to his value, the barriers are made proportionally strong, and he is left to exhaust himself in powerful, but unavailing, attacks upon the bars.

Strong nooses are at length thrown in, and as soon as one of them catches him by a foot, it

is made fast to the palisades, and the operation is continued till he be fairly moored. The mooring is farther secured by cross bars, thrust through the palisades; and then they proceed to bind him with a number of strong ropes,—his attention being engaged by teazing or by food all the time that the operation of tying is going on. When his fetters are judged to be strong enough, two cables are fastened to his collar, he is loosened from the palisades, and driven forward by two tame elephants that are trained to the work, and picketted with more or less severity according to his strength and temper, in order that his subjugation may be completed in solitude. When the tame ones are withdrawn, and he finds that he cannot accompany them, he becomes perfectly furious, and some are killed by their struggles; but starvation reduces the majority; and they soon resign their great strength to the pleasure and guidance of their pigmy masters. So great power has even a little intellect, aided by fire, an instrument that man alone can command, over mere animal strength, however admirable may be the mechanical structure in which that strength is contained. It is the fire that is the real instrument of the superiority. It is the badge of man; and in those lands where his person is the most uncouth, his powers the

least developed, and his condition the most miserable, smoke which rises on the beach is the most immediate and obvious criterion that the inhabitants are men, and not apes; and if any future zoologist shall revive the Linnæan arrangement, and class men and monkeys into one order, it were more in accordance with truth to discard the word *sapiens*, as the specific distinction of man, and substitute for it the epithet *ignigerens*.

The Indian elephant has sometimes, though rarely, been found measuring ten feet and a half in perpendicular height at the shoulder; and when of that size, their weight, in good condition, is more than five tons. Nine feet is the standard for male elephants, required for the service of the India company; and that may be about the average of those that are caught on the rich pastures near the sea. The females are in general about a foot lower than the males; and the size of both is so much inferior in the dry and hilly districts, that they are not much esteemed for carriage. A sized elephant can carry a load of nearly a ton, so that a loaded elephant is one of the heaviest carriages that move upon land. Its motion too is rather rapid, as it can travel about fifty miles in a day; but the pressure upon its feet is so great, that the rough and stony roads, which are common in

the hill districts of India are very hurtful to its feet. Otherwise it is remarkably sure footed,—more so, naturally, it is said, than the horse or the camel; and it has the advantage over them of being able, in cases of emergency, to hold on with the trunk. Upon level ground it stands out well; but ascents and descents are very fatiguing to it, as it has to lift, at least, four tons in the one case, and bear the shock of an equal weight in the other. From the natural antipathy that the elephant has to fire, it is no longer formidable in the ranks of battle, as the discharge of a pistol would send him scampering to the right-about; but he is very serviceable as a beast of burden, in a country where the roads are naturally bad, and, on account of the violence of the rains, kept in order with great difficulty. He is, however, only a beast of burden, and never employed for draught, though he assists in lifting guns, and other weighty articles, out of holes from which the bullocks that are used for draught cannot pull them.

The rhinoceros is more confined in its range than the elephant, being still fonder of water than even that animal. In clumsiness of figure, the rhinoceros exceeds the elephant, and it approaches that animal in the mass of its body; but as it is much shorter in the legs, it does not appear so large. In length it is about the same,

being twelve feet in the larger specimens; but these do not stand above seven feet high. The skin of the rhinoceros is coarse, thick, and folded, and of a dull black colour; but, instead of being impenetrable by weapons of hunters, as has often been said, it is delicate enough to be annoyed by the weapons of insects; and as the animal has not the means of washing them off as the elephant does with its trunk, it has recourse to wallowing in the mud, and endeavouring to cover itself with a protecting coat of that substance.

The eyes of the rhinoceros are small, and its powers of vision far from acute; and, indeed, in the jungles and thickets which are its principal places of resort, vision is, comparatively, of little use to it. Hearing and scent are what it depends upon, and both of these senses are remarkably acute, more especially the scent, which renders it dangerous to approach it, unless against the wind. As is the case with the elephant (and indeed with the *pachydermata* of Cuvier generally), the organ of touch is the upper lip; and though that does not resemble, in the least, the proboscis of the elephant, it is considerably elongated, and the animal uses it as a sort of hand for gathering food and conveying it to its mouth. The rhinoceros is much better furnished with teeth than the elephant, having

twenty-eight grinders, and four cutting-teeth, so that it can cut and gnaw substances which are too hard and tough for being plucked by the prehensile upper lip. The inside of the mouth is remarkably firm, and the tongue, in the adult animal at least, beset with tubercles, so that it assists in swallowing. The food is wholly vegetable; and though, like the elephant, the rhinoceros shows some taste, and prefers the succulent vegetation of the cultivated fields, among which it commits great ravages when it sallies from its solitudes, it can browse upon the most hard and prickly vegetables.

The most singular thing about the rhinoceros is its horn (there are smaller species, or probably varieties, that have two), which differs from that of every other animal. It is inserted over the nasal bones, about equally distant between the nostrils and the eyes; and the bones at that part are remarkably strong, both from the volume of their substance and from their form, which places the horn as it were on the crown of a dome, and thus gives its base a maximum of strength.

The horn of the rhinoceros is a true horn, formed almost wholly of gelatine, like the ordinary hair, fur, feathers, and bristles of animals, and containing very little of those salts of lime that constitute the greater part of bone; and

it is not supported by a core of bone, like the horns of the ox tribe, but originates wholly in the skin, the part of the body in which all the corneous addenda of animals are secreted. It consists of a bundle of longitudinal fibres, and not of plates, like the hollow horns; and these fibres are often so worn and separated towards the base, that it has the appearance of being surrounded with coarse bristles.

This structure renders the horn of the rhinoceros, in many respects, a much more formidable weapon than the tusks of the elephant. It is much less frangible, living horn being very difficult to break against the fibres; and when it exerts a great strain, the pain to the animal is not nearly so great as if it had had its origin in a socket of bone, or had been supported by a core of that substance. It is formidable from its size, too, as it is often three feet in length, and more than six inches in diameter at the base. It has such a curvature upward, as that when it is horizontal, the whole force of the muscles that raise the head, can be exerted in giving it effect. Even when the rhinoceros stands at bay, the most daring animal dares not attack him in front. The mass of the animal, planted upon its strong short legs, with a broad foot and three spreading toes at the base, offers a resistance which the shock of no beast of prey

could move; while, to the strongest of them, the gore of the horn would be instant death. If the animal should charge, which it can do at a tolerably rapid pace, the crush is dreadful; and when the elephant is assailed by his fellow-tenant of the forest, which is very seldom the case, except when the elephant bears a hunter on his back, he has no security but in flight; and if he cannot betake himself to that, he has no chance but to receive the shock on the least vital part of his body, and even then it dashes him to the ground.

But, notwithstanding all this power of defence and terribleness of attack, the rhinoceros does not seek strife, but leads an inoffensive, and comparatively indolent life in the jungle,—at peace even with the tiger, with whom he is often found in company, and towards whom he shows an indifference quite unknown to the elephant. Man has never brought him even into that partial subjection to which the elephant yields; the hunting of him is a mere sport, though a very dangerous one; and when he is taken alive, he is fit only for a show, in which condition, though he evinces some gratitude for food and kind treatment, his general character is sullenness, broken by occasional fits of violence.

Such are the two most remarkable subjects of

Indian zoology; and, with the exception of Africa and the Indian isles, in the former of which the species, or, at all events, the varieties, are different, they are confined to India; and, in the case of the rhinoceros, to a limited portion of that. They seem intended to keep down the exuberant vegetation of the districts alluded to, so that spots may be found that can be broused by quadrupeds of humbler growth. The variety of these, and also of their destroyers, is very great. The wild animals in those places, are mostly deer, and antelopes of different kinds, with buffalos. The musk deer is found on the south of the Himalaya, but not equal in quality to that on the north. Wild hogs and boars are numerous in the jungles; and there are various kinds of bears. In the mountains toward the south there is a black species, in considerable abundance; but inoffensive, and living upon white ants and fruit; and, on account of the numbers of the former that they destroy, they are benefactors to the people. To the east of the mouth of the Ganges, a more ferocious bear has been encountered, which differs from most of the genus, in having a short smooth covering, and the head formed something like that of a dog; wolves, jackals, and hyænas abound; and there are wild dogs of the cur species; but whether they have

escaped from domestication, or are originally wild, has not been ascertained.

India is, indeed, redolent of all kinds of animal life, of the destroyers, as well as the destroyed; and teeth, folds, and poison, though exerted in a variety of ways, still find "the supply equal to the demand."

There is no satisfactory proof of the presence of the lion in India; and thus the king of the feline race there is the tiger—a more formidable animal certainly, taking all circumstances into consideration, than the lion of Africa. He is more numerous than the lion, more active, and comes more in contact with the habitations of men; and when those direful wars which the native rulers were in the habit of waging to desolation upon unfortunate districts, had done their work, it was astonishing how rapidly the jungles and the tigers reoccupied the country. The bound of the tiger, when he springs upon his prey, is tremendous, extending, as is said, to the distance of one hundred or one hundred and twenty feet; and independently of teeth and claws, the very impetus of such a mass of matter, flung to such a distance, would fell most animals to the earth. It is from this spring that the tiger gets his name: he, as it were, "shoots himself at his prey;" and *tiger*, in the Armenian language,

signifies the *arrow*, the name also given to the river Tigris, on account of its velocity: we believe that in some, if not in all, the native languages of India, the name of the tiger is *tippoo*.

It would be easy to fill volumes with tales of tigers, as we have them, *ad nauseum*, in most of the popular books, whether they happen to give us any more useful information or not; suffice it to say, that of all the beasts of prey the tiger is the most agile and daring—equal in strength to any other (for the lion and he have never joined in combat on a field native to them both)—the most abundant, and, therefore, the most destructive. Like all other wild beasts, the tiger is afraid of fire; but his appetite is so ravenous, that, if he be pressed with hunger, that is not a perfect security, unless there be a great deal of it. Minor animals of the feline race, such as panthers and leopards, are very numerous in India; and were it not that the tiger is so superior to them in the power of destruction, they would be accounted very formidable. In one respect some of them are more dangerous than the tiger—they follow their prey, and even climb trees after it.

Nowhere are the serpent tribe more formidable, either for their muscular strength or their poison, than in India. Of the writhing or

crushing snakes, of course the most formidable is the boa-constrictor, which some of the narrators represent as being forty feet long, and committing great havoc among quadrupeds, even those of considerable size. The moist and shaded parts of the country, especially on the west coast, and where there are ruins, swarm with snakes of all dimensions and colours, some of them poisonous and some not. In the passages of the Ghauts, during the rains, and so long as the ground remains moist, leeches are a great annoyance to the naked legs of the people, though, perhaps, not so much so as in the island of Ceylon. Bats are very numerous on the Malabar coast, and of large dimensions; the dark apartments of the old cave temples are filled with them. In such a country, insects are, of course, abundant, and some of them are very troublesome to the inhabitants. Wherever they are found, the white ants are the most destructive of insects. Those insects consume every thing indiscriminately, except metals and stone: and they approach to make their ravages in a covered passage, so that they are seldom seen. In the evening the earth is made radiant with the twinkle of glow-worms; and the fire-flies often so cover the trees that the whole is one mass of light, and the shaking of a bough produces nearly the same

effect as the beating of a burning bush in other countries—it fills the air with sparks of fire.

The birds of India are equally remarkable for their number and for the beauty of their plumage. The radiant hues of the peacock still gild the thickets in all parts of the country, and they did so in the time of the Macedonian conqueror, who was so much charmed with their beauty that, under severe penalties, he forbade their destruction by his army. Among the groves and thickets on the Malabar coast, they are still very numerous; and are captured during the night, by a torch, and a painted canvas, containing an imitation of one of themselves. The parrot tribe are found in all their varieties of form and colour, and the ear is literally deafened by their noise. The birds of India are beset by many enemies, both in their own persons, and in the contents of their nests; and that leads to some of the most curious arts of nidification that are anywhere to be found among the feathered tribes. One of their greatest enemies is the tree snake, which can climb its way to any height, and suspend itself by a very slender support. To guard against that enemy, a little feathered inhabitant of the neighbourhood of Bombay,—a thing not much bigger than a cockchaffer,—fixes its tiny nest to the pointed leaves of the palmyra palm,

which the snake cannot reach, and there rears its brood in safety. But of all the winged architects of India, or, perhaps, of any other country, the Indian grossbeak (*loxia philippina*) is one of the most ingenious. The bird is rather bigger than the one last mentioned. In bulk it exceeds the common sparrow of our gardens, and, therefore, its nest would weigh down the tip of a leaf till it came in contact with others, and, therefore, bring the treasure which that contained within reach of the enemy. To prevent this, it has recourse to a very ingenious contrivance. It builds in a variety of trees, but it prefers the Indian fig; and making choice of a very slender twig, it plaits a rope of grass and vegetable fibres, at least a foot and a half long, and to the end of that it fastens its snug and very ingeniously constructed nest. Externally that nest is formed of the same materials as the cord by which it is suspended, and plaited in the manner of a basket. Internally it differs from most nests, in containing a suite of three apartments, which are partially separated from each other, and yet have one common entrance and a communication with each other. The first apartment is for the male, who keeps watch there, while the female is performing her incubation, and as his beak is powerful in proportion to his size, he

offers a bold defence against ordinary winged foes, while the rope by which the nest is suspended is a sufficient protection against the snake. The second apartment is for the female; and the third, and most secure, for the young. This nest is, in itself, abundantly ingenious, but those who are fond of heightening nature with their own fancies, render it a good deal more so. The male has, generally, a light in his apartment; and thus it is easy for fancy to endow him with the lantern as well as the vigilance of a watchman. In one corner of his apartment there is generally a little bit of moist clay, upon which there are fastened one or more glow-worms, which partially illuminate the little apartment. These insects use them in preference to any others, simply because their light betrays them, and they can be caught in the twilight, and they are a supply of food for the young grossbeaks in the nursery behind; but there are, in all departments of natural history, more violent and improbable strainings of the fact than the supposition that they are placed there for the purpose of giving light; and certainly there would be something very wonderful in a bird lighting up its apartment, as it would be an instance without a parallel in animal history.

Besides the peacocks, already mentioned, the jungles of India abound with large gallinaceous

birds, of which the most numerous and valuable is the jungle-fowl, or Indian cock, (*gallus Indicus*), which, though the fact of their identity has not been ascertained, is sometimes supposed to be the origin of the common domestic breed.

One of the most remarkable, and even useful birds, though a bird of passage, and not used as food, is the gigantic stork, (*ciconia argala*). It makes its appearance in large flocks during the rains, and, though an ugly bird, it is welcomed as a scavenger. This bird is of very large dimensions. The wings have an extension of nearly fifteen feet; the whole length is between six and seven feet; and it stands more than five feet in height. The colour on the back is an ashen grey, and that on the under part, a dirty white. The gape is immense, and the craw, which appears very prominent on an outside view, and is very large, is covered only with a thin down. Its food is reptiles, fishes, and carrion; the quantity which it can swallow is enormous; and it is on that account that it is useful, as it destroys those noxious creatures, which, otherwise, would be an intolerable nuisance in the houses, and consumes those decaying substances which, but for it, would pollute the atmosphere. In consequence of the services which it thus renders, this giant bird, under

the name of the *adjutant*, perches upon the house tops, or marches about the public places undisturbed.

The ass is not much used as a beast of burthen in India, but numbers of them are found wild upon the plains and borders of the salt marshes, in Ajmeer and Gujerat. The ass, indeed, is under greater odium in India, than in any other country. No Hindû but those of the very lowest castes, will ride upon one of those unclean animals, or even employ it in the meanest service; and the place where it is killed, or its dead body cast, is looked upon with still greater horror than that which is polluted by the remains of the sacred cow. In Mysore, a dead ass is made use of for the purpose of driving away any one who may have given offence, though he who slays the ass must flee from the pollution, the same as he against whom it is slain.

The camel is most used in the countries on the north-west of the desert, or in travelling thence to the countries on the Jumnah. In the Punjaub they are particularly abundant; and long files may constantly be seen, carrying rock salt in great blocks from the mines near Lahore. In the mountains of that part of India, the two-humped camel is found in a wild state.

The genus *bos* are the animals used for draught all over India. They are very numerous, and of several species and varieties. The native or sacred cattle of the country, are the zebua, which are white, with a hump on the neck, and though but small and light, they answer well for the draught. The common black cattle, and the buffalo, are stronger and more prized by Europeans.

The native breed of horses are so small that they more properly fall within the class of poneys; and are sometimes not more than two feet and a half in height. They are strong in proportion to their size, but they are ill-formed and vicious. The horses that are bred in the mountain districts are larger and more serviceable, and some of them (especially those from Nepâl) are singularly mottled with a variety of colours. The breed in the Deccan is much better; but they are not equal to those which are now raised by the British in the Valley of the Ganges, and from which the breed all over the country promises soon to be improved, as they begin to be sought for with avidity by the natives.

The sheep of India are in considerable numbers; but they are of little or no worth. They are, in general, lean, and the wool, or rather hair, with which they are covered, is of

comparatively little value; but in a country where cotton is so abundant, and forms so exclusively the scanty clothing of the native population, that is a matter of minor importance. In the warm climate of India, indeed, that species of animal covering which is best adapted for the finer productions of the loom, would be highly inconvenient for the animal, and, accordingly, it is not found.

When the great ridge of the Himalaya is passed northwards, the climate is wholly different, and the wild animals have an abundance of covering. One of the chief inhabitants of the elevated parts of the mountains, where the changes of temperature are in excess, and where a maximum of animal clothing is, in consequence, required, is the musk animal. From its belonging to the ruminating order of animals, this has been called the musk deer; but in appearance, and also in size, it more resembles a hog, only the limbs are much more delicate. Its covering is well adapted to the places which it inhabits, —sticking out all over it, to the length of about three inches, and being of a consistency which water can hardly injure. As is the case with some other species of ruminating animals in that part of the world, the tusks of the upper jaw are curved, and project a considerable way outside the under one. The perfume is

secreted by a peculiar gland under the abdomen, and is found only in the male. From the great estimation in which this perfume is held, the musk animal is accounted royal property, and can be hunted only by royal permission.

The larger animals on the north of the Himalaya are often provided with two sorts of covering—a long hair for throwing off the rain and snow, and a short one for warmth. It is of this secondary, or short fur, on the goat, that the celebrated shawls of Cachmere are made; and, probably, the under fur of the cow in those mountains, which is of a similar texture, might be used for the same purpose. The shawl goats are but little creatures, less than the smallest breed of sheep in Britain. They are of various colours, but in general have those somewhat resembling the deer. As the impenetrability of their double coat fits them only for a climate that is permanently severe, it has been found impossible to rear them on the south side of the Himalaya. Were it possible to transport the breed there, it is by no means improbable that they might thrive on the mountains of Norway, or even in the higher valleys among the Grampians.

Such are a few of the land animals of India; and, from their numbers, it may easily be in-

ferred that the waters are equally prolific. On the muddy shores, as that at Chittagong, and at Cochin, oysters are abundant; and there are plenty of fish in most of the seas, and in many of the rivers. The mango fish of the Ganges is in high esteem at Calcutta; and the carp of many of the mountain streams, especially of the Alacananda branch of the Ganges, are equally prized for their size, beauty, and flavour.

CHAPTER XII.

THE OUT-SETTLEMENTS.

THE preceding chapters of this volume contain all the notice which, in the limits within which this little work must be confined, can be given of the physical character of continental India. In many cases these may seem to be but mere hints; but they will serve to furnish those who are not particularly interested in the country with a general notion of it, and may be of some use as a preliminary index to those who may have the desire or the occasion to study it more in detail.

To render this part of the subject the more complete, it will be proper to notice those

points, unconnected with continental India, upon which the British power has taken hold, and then we shall be enabled to enter upon the examination of human nature, and its history, in India, with the whole of the preliminary matter before us.

During the late war, and even since its close, the out-settlements in the Indian seas were more numerous than they are now—those in the island of Sumatra having, in 1825, been exchanged with the King of the Netherlands for some, formerly Dutch possessions, on the main land of India. Those that now remain are Ceylon, Prince of Wales' Island, Singapore, the Andamans, and Macao, in China; though the Andamans have been visited and claimed rather than settled, and the only footing that the East India Company have in China, is a toleration to trade, under strict and particular regulations.

CEYLON.

Ceylon, whether we regard its position, its extent, its appearance, or its productions, is a very important portion of the earth's surface; and, like India, it has had its name and its fame from the earliest dawn of history. The early

history, however, whether as stated by the chroniclers of the west or the east, is unsatisfactory; and whether we take the few hints that are contained in the writings of the Greeks and Romans, or the more detailed, but more ridiculous fable of the overthrow of Ravan, its ferocious monarch, by Rama, the rajah of Oude, assisted by his army of monkeys, led on by Hanuman, the wisest and most valorous four-handed inhabitant of the forest, who won almost as much godship in the enterprize as Rama himself, and made the whole monkey tribe kindred to the gods, we find equally little satisfaction—nor can we come to any other conclusion, than that such an island had been heard of, both in Hindûstan, and in the west, ere the arrival of the Portuguese in the Indian seas. The name from which the modern one is formed is *Singhala*, the country of lions, which may have been intended as descriptive of the disposition of the people, as the lion has not been met with upon it, at least in modern times.

Before the arrival of the Portuguese, the fertile and tempting shores of Ceylon were visited by hostile Arabs; and it was under the specious pretext of assisting the native prince against these, that Almeida obtained that en-

couragement and tribute which were the foundations of Portuguese power in the island. This took place in 1505. About a century after, the Dutch made their appearance on the coast, and entered into the same agreement for the expulsion of the Portuguese that these had done for that of the Arabs, and succeeded, after a contest of about fifty years. These held their sway in a manner even more tyrannical than their predecessors, until, in 1796, their dominion gave place to that of the British, and the king found, somewhat too late, that each of his foreign visitors was more powerful than the former; and, ultimately, after a good deal of war, in which, however, the country and the climate were more formidable than the troops of the native powers, the whole island became, in 1809, a British colony, not under the East India Company, but under the crown, and thus having its ports and commerce open to the whole British people. This circumstance takes Ceylon out of the India question, because the possession of it would not be affected by the fate of the Company's charter.

Ceylon is nearly in the shape of a pear, having the length north and south, and the larger end toward the south. Its limits, from north to south, are from 5° 56′ to 9° 46′ north

latitude; so that the length is about two hundred and seventy miles. The limits from west to east are from 79° 36′ to 81° 58′, so that the greatest breadth is about one hundred and fifty miles; but the average is not much more than one hundred. Ceylon is about sixty or seventy miles from the nearest point of the Coromandel coast, which is a long, low point of sand, on the south side of the river Vaygaroo. From the termination of this point, all the way to the coast of Ceylon, there is a succession of banks and shoals, known by the name of Adam's Bridge, because the natives, who believe that their island was Paradise, decribe these as the footsteps of the first man, when, after the fall, he escaped thence to the continent. The sea, to the southward of this chain of shoals, gets the name of the Manaar passage, from an island of that name at the termination of the chain upon the coast of Ceylon. The passage on the north, which is toward the Ceylon side, is also much broken by islands, and also by points of low but fertile land, much intersected by the sea, upon one of which the town and fort of Jaffnapatam are situated.

The shores of Ceylon are in general low and sandy, and in many places broken by lagoons, which usually have their length parallel to the

coast; but there is hardly any thing that can be considered as a bay, except that of Trincomalee, on the north-east coast, and the country around that is both barren and unwholesome. The bay is, however, valuable as a convenient and safe retreat for the shipping, when driven, as it annually is, both from the Malabar and Coromandel coasts, by the violence of the south-west monsoon. Though, generally speaking, the coasts be sandy, they are interspersed with rocks, and abound with cocoa-nut trees, and other palms, which afford vegetation and shade almost to the very verge of the sea. As is generally the case in tropical countries, the interior backs of those flat shores, where the central slopes and elevations begin, are covered with jungles, and remarkable for the insalubrity of their climate.

The surface of the inland parts is very much diversified. Hills rise over each other in successive ridges,—some of them clothed with the most rich and beautiful vegetation, and others exhibiting the most wild and abrupt precipices. In the interior, the mountains rise in chains, some of the plains and slopes have an elevation of from four thousand to five thousand feet above the level of the sea; and Adam's Peak, the highest summit in the island, has a height of

more than six thousand. This most lofty of the summits is in the south part of the island, and the country there is, generally speaking, the most elevated. The city of Candy, formerly the capital of the Cingalese kingdom, and situated near the centre of the island, has an elevation of nearly one thousand five hundred feet; and enjoys a climate which, notwithstanding its being so much nearer the equator, is temperate as compared with that of Bengal; and the more elevated parts of the island have, of course, a still more temperate atmosphere.

The appearance of those inland parts of Ceylon is very much diversified: some are covered by thick and almost impenetrable forests; others are open, verdant with herbage, and enamelled with flowers; and others, again, wild with rocks. There is a natural barrier of jungle between the coast and the interior, which more completely separates the two than if it were an equal breadth of water; and this jungle is, throughout its whole extent, unhealthy. While the Portuguese and Dutch had possession of the island, and till the final subjugation of the kingdom of Candy by the British arms, this formed the separation between the two powers, whose countries, though within a very

short distance of each other, had very different characters.

There are no lakes among the mountains of Ceylon; and the rivers, generally speaking, are small, and have their courses from the mountains to the nearest sea. To this, however, there is one exception—the river Mahavelly, which rises on the north side of Adam's Peak, has a course of about thirty-five miles direct north to the city of Candy, near which it passes over a ledge of rocks; thence it bends to the eastward for about thirty-five miles; after which it flows north to the sea over about seventy miles more; and it empties itself by three principal mouths, (two of which enter the Bay of Trincomalee) after a course of about one hundred and fifty miles. This river is navigable, partially at least, to Candy, or more than one hundred miles from the sea, including the windings; but below Candy, it passes through thick jungles, and between wild rocky mountains. Another small river, the Calany, rises in the west side of Adam's Peak, traverses the celebrated cinnamon district, and falls into the sea at Columbo; but it is navigable only for barges, and that only during the rains. Most of the other streams can be ascended only ten or twelve miles, and the

entrances to them are in general choked up by trees and banks, so that, in point of inland navigation, Ceylon has not much to boast of.

From what has been said of the general character of the coast, it will also be easily imagined that there cannot be many good harbours there. Trincomalee is, in fact, the only one which is worthy of the name. Jaffnapatam (Jaffna is the name of the tongue of land on which it is built, and which is an island or peninsula, according to the season) is a fertile situation; and from the constant play of the sea breezes over it, it is healthy; but it can be approached only by boats, and the adjoining sea is shallow and full of banks. This part of the island is very rich in tropical productions—rice, fruits and tobacco; but the seeds of European vegetables soon degenerate, and the potato, which has been found a valuable addition to the agricultural produce of some parts of India, has not been found to answer.

For a part of the distance between Jaffnapatam and Manaar, it is not very easy to say whether the country is sea or land. The surface is water; but it is in general so shallow, and the bottom under it so firm, that it can be walked over. Still farther south, on the coast opposite to Coromandel, there is a singular peninsula, Calpenteen, which lies parallel to the

shore, from which it is divided by a very narrow portion of water, which extends from the isthmus, at the south end, between sixty and seventy miles. This peninsula, though sandy, is thickly covered with cocoa-nut trees and palmira palms; and the country on the other side of the bay, or, rather, natural ditch, is very rich and beautiful. This curious peninsula extends south as far as Chilaw, a distance of about one hundred and fifty miles from Jaffnapatam; and along the whole of that line of coast, no mountains are visible from the sea—verdant woods forming everywhere the boundary of the horizon.

After passing Chilaw southward, the mountains begin to make their appearance, while the coast retains its beauty, and indeed gets more luxuriant in appearance as Columbo is approached. At Negumbo, about forty miles to the north of Columbo, the cinnamon country begins, and it extends to a considerable distance south of that city. Columbo is a very beautiful place, with proper attention to avoiding the direct action of the sun, very healthy, and it contains a number of inhabitants. The city itself is nearly insulated by water, but the land immediately across the lake is the most rich and picturesque that can be imagined. Small vessels only can approach the shore at

Columbo, and while the south-west monsoon blows, ships cannot ride in the roadstead, but must either leave the island altogether, or pass round to Trincomalee. For everything that can make the earth delightful and desirable, it is hardly possible to imagine a place superior to the neighbourhood of Columbo; but on the peninsula the water is brackish.

South from Columbo the cocoa-nut trees get still more plentiful, and the formation of cables of the fibres is one of the staple manufactures of some of the villages on the coast. This richness and beauty continue along the whole of the south-west and south; and there is then the advantage of at least a tolerable harbour at Point de Galle, a few miles west of the southmost part. The province of Matura, in the extreme south, is also celebrated for its scenery, the groves and thickets there alternating much more with open glades than in other parts of the island. Dondra Head, the southmost part of the island, lies a few miles to the east of the little town of Matura; and a few miles inland, there is a single block of stone (Mulgurelenna) three hundred feet in height, with a flight of five hundred and forty-five steps, of great antiquity, winding to the summit, which is crowned with a tomb, or temple, of Bûdha, in the shape of a bell.

After passing the south point, the character of the coast changes much for the worse. It is unhealthy, covered with wood, broken by salt marshes, and infested with wild beasts. Even this country, were it properly cleared, would be very fertile, and probably much improved in point of healthiness; but in its present state, neither cultivated plants nor domestic animals are safe, the elephants attacking the former, and the beasts of prey the latter. This general character of the coast continues all the way to Trincomalee; and thence to Jaffnapatam it partakes of the character of the coast immediately to the south of that settlement. The interior, where not completely overrun by forest or jungle, combines the greatest fertility with high picturesque beauty; but the great inequalities of the surface, and the frequent succession of tangled forest, render the traversing of it a work of much labour; and wild animals and large snakes are so numerous, that it is also a work of considerable hazard. In many of the valleys the wet husbandry (the particulars of which will be noticed in a future chapter) is carried on, and artificial tanks are constructed for that purpose, though they are by no means so indispensable as in the comparatively parched country of India,—more especially the part immediately adjacent to Ceylon.

A mere glance at the position of Ceylon upon the map, taken in conjunction with the fact that the central parts are high, and bearing in mind the direction of the monsoons, would immediately lead to the conclusion that the climate is moist, and that the west side should be superior to the east. The south-west monsoon begins early in April, and blows till November, or at least till the middle of October. During the first part of this monsoon, the rain is very heavy, both on the west coast and among the mountains; but only partial showers extend to the east coast, though the wind extends over the whole island. Generally, the rains upon the west coast of Ceylon are neither so heavy, nor accompanied with so violent winds or thunder storms, as those upon the Malabar coast of India; but they have been sometimes so great at Columbo, that more than three inches have fallen in the space of twelve hours; and occasionally there are dreadful hurricanes, accompanied by rain and hail, on the south part of the east side. The northern part of that side often has the atmosphere without a cloud, and a very high temperature, while the rain is falling copiously upon the west coast, and among the mountains. The descent of water from the eastern slopes of those, its being arrested by the jungles at their base, and the consequent

evaporation impregnated with miasmata, seem to be, as is the case in the jungle of the Terriana, on the north-east side of the plain of the Ganges, the chief causes of the insalubrity of that coast of the island.

The rains on the east and north-east come with the north-east monsoon, which lasts from November to March, and the rains are very heavy in December and January, while there, the remainder of the year is comparatively dry. This monsoon also extends to the mountains, so that showers fall there for the greater part of the year; but on the southern part of the west side it is not long or severely felt. Even there, however, the sea and land breezes are apt, from the vicinity of the high mountains to the sea, to bring occasional showers, so that the west coast invariably looks fresh and green. The great extent of sea on both sides, in the direction of the monsoons, and the elevated and varied character of the surface, tend to soften the extremes of the climate of Ceylon, as compared with that of India.

The great mass of the Ceylon rock is of the primitive formation, granite or gniess, intersected by veins of other rock, but without any trace of volcanoes. The rocks along the shores are in general sand-stone; but in the low districts near Jaffnapatam, the strata in-

dicate a marine origin, there being a considerable quantity of shelly lime-stone and coral rock.

There are very few metals in Ceylon. It was the vulgar belief that all rich countries contained gold, and therefore it has been said that Ceylon contained that metal, of which, however, there are no indications. Iron and manganese are the only metals,—the ores of the former being pretty generally diffused and rich. Precious stones are very abundant, and some of them, as the sapphire, the aqua-marine, and the tourmaline, are of great beauty. They are most abundant in the south of the island; and are chiefly found among the clay at the foot of the mountains.

One natural product of Ceylon, or rather of the adjoining sea, is its pearls. The principal beds for these are in the Gulf of Manaar, to the south of the island of that name; and they range, with some interruptions, over a space of about thirty miles from north to south, and about twenty from east to west. The centre is opposite Candatchy, about twelve miles to the south of Manaar. The depth of water over the banks is from thirty to forty feet. Both the oysters and the pearls are a lottery; one boat will land thirty thousand in a day, while another, at no great distance, may not get above

a hundred or two; and one oyster will sometimes contain more than one hundred pearls, large and small, while one hundred others will not contain one. The shell is clumsy, of an oval form, about three inches and a half long, and two and half broad. The quantity taken up in the fishing is so great, that the ground becomes exhausted, and has to be let alone for some years.

But notwithstanding the gems in its soil, and the pearls on its banks, the chief value of Ceylon, like that of India, is in its vegetable produce. Rice is the chief grain cultivated for human food, and hitherto the quantity produced has not been adequate to the supply; but ever since the island was known to Europeans, till within those few years, it has not been in a condition for enabling a fair estimate of its capabilities to be formed,—as there has been the hostile feeling between the Candians and people on the coast, and between the former and a mountain race of a very wild character, who inhabit the fastnesses of the interior, climb the trees after the manner of monkeys, and are supposed to be the aborigines, who have been expelled from the elevated country by the Candians, (who are probably from Bengal,) and by the people of the Malabar coast, from the level district in the north, toward Jaffnapatam. The brief notice that

we may afford to take of the population must, however, be delayed till we come to glance at the people of India generally.

The fruits of Ceylon are unrivalled; and it is the grand garden of the cinnamon, one of the most agreeable of aromatic plants. The bark of this tree, the *laurus cinnamomum*, is the chief export, and has been, to Europeans, the chief wealth of Ceylon. It is confined to a comparatively small part of the surface, that which we have mentioned as being the most healthy and beautiful part of the coast, extending from Chilaw, about the middle of the west, to a little beyond Dondra Head, in the south. The tree grows wild; but the best is that which is in a cultivated state, and the largest plantations are in the neighbourhood of Columbo. All the aromatic qualities of cinnamon appear to be concentrated in the bark, or rather, perhaps, in the proper sap that descends by the inner bark, for the formation of new wood, because it is when that action renders the bark easily separated, that it is in proper condition. The shoots from which the bark is taken are esteemed best when they are about three quarters of an inch in diameter; when they are much older, the flavour is very inferior; and out of the small and healthy district that has been mentioned, the tree is not worth cultivating.

Though the animals of Ceylon bear a considerable resemblance to those of the main land of India, there are some differences. The elephants of Ceylon, which are very numerous, are larger, and of finer appearance, than those of the continent, and great numbers of them have been caught and exported, as well as used in the island; but the use of elephants in India is now rather on the decline; as, notwithstanding all their strength, they are more showy than useful, at the same time that they are very expensive. Deer are very abundant in the woods; and there is one species remarkable for the elegance of its form, which is not bigger than a hare. The oxen have a lump, and are very small, but strong for their size. Buffalos are equally abundant, larger, and therefore better adapted for useful purposes. Sheep do not thrive on the island; and there are no horses, except in the possession of Europeans, or that have been introduced by them. Indeed the climate does not seem favourable to cattle and buffalos, as they are apt to be much thinned by *epizooty*, without its being easy to assign any immediate cause. The large striped tiger of India cannot be met with in Ceylon; but there is a species, spotted something like the leopard, which, though not so large and strong, is abundantly ferocious.

In a country so warm, and, generally speaking, so fertile in vegetable produce, all the species of animal life must be in excess; and accordingly, in quadrupeds, in birds, in insects, and in reptiles, there are not only countless individuals, but countless species. One of the most singular creatures is the house-lizard, which, though of considerable bulk, can run up a perpendicular wall, or even along a beam or roof, with its back undermost, with the same facility as a fly. It does so by the same means; that is, by having the feet constructed as suckers, by means of which the creature can adhere to any surface, whether rough or smooth, as the whole surface of the foot is instantly applied in such a manner as to be air-tight; and as the weight hangs by the middle of each sucker, the pressure of the atmosphere, by which its fall is prevented, is very considerable. Instead of being a nuisance to the inhabitants, this singular creature is very useful, by destroying the flies with which the houses are very much infested, and which so throng round the lamps, that, were they not eaten by the house-lizard, they would absolutely extinguish the light. There are, however, many noxious reptiles. One of the most annoying of these is the leech, probably the same species that is met with in the Ghauts,

and in some of the other islands. During the dry season, these little creatures are concealed in the jungles, or under the ground; but when the surface is wet, they swarm in such numbers, and are so persevering in their attacks upon the feet and legs of travellers, that hardly anything will keep them off. Their bodies are remarkable for flexibility, and they can draw themselves out to so fine a thread as to be hardly visible; and thus they can insinuate themselves into any opening, however small. Their bites, when neglected, are apt to bring on topical diseases, which, from the heat of the country, end in gangrene and death. The labouring people, who generally go with the feet naked, are very much annoyed by them.

Considering the size of Ceylon, which is about the same as that of the main land of Scotland, and the great fertility of those parts of it which are fit for cultivation, it is but thinly peopled. Where there are wild tribes in the mountains, a correct estimate cannot be taken; but it is probable that the whole, of all nations and classes, do not exceed a million, if they do not fall considerably short of that amount.

PRINCE OF WALES' ISLAND.

This small, but advantageously situated

island, to which the natives give the name of Pulo Penang, or the Betel-nut Island, has been acquired in a manner different from most other oriental territory. It lies close to the Queda shore of the Malay Peninsula, in latitude 5° 25′ north, and longitude 100° 19′ east. Captain Light, the commander of a country ship—or ship trading from India to the adjacent seas, married a daughter of the King of Queda, and received Pulo Penang as a marriage portion. The East India Company, to whom Captain Light transferred the island, very properly left the establishment of a colony to him; and since 1786, when it was taken possession of, it has greatly improved in productiveness, in population, and in commerce.

The island is an irregular four-sided figure, about fifteen miles in length and eight in breadth. The north-east angle is very near the coast of Malaya, but the channel southward is about two miles wide, and forms an excellent roadstead for shipping; there being shelter from the hills of Queda on the east, and the elevated part of the island on the west. The high grounds are on the north and north-west, and from these the surface slopes to the south-east, and is well supplied with small streams. The hilly part is still covered by the remains of the dense forest which occupied the whole

island for ages, and furnished it with that coating of vegetable mould, by means of which the portion that is cleared has been so productive. The timber of that forest is of large dimensions and excellent quality; single trunks being found of sufficient size to form the lower mast of a seventy-four.

The south and east parts of the island, which are now cleared, are chiefly planted with fruits and spices. The common productions of India and Ceylon, and those of the eastern Archipelago, as well as the West Indies, are brought together in Prince of Wales' Island; and it would not be easy to name a fruit or a spice of the tropical countries which is not to be met with there in perfection. These fruits and vegetables are sold to the vessels which frequent the harbour. The staple article of export is pepper; but as the place has the advantage of being a free port, it is the mart of a very considerable trade. The productions of Europe, of India, and of the surrounding coasts and islands, being all brought for exchange there.

As the trade, or rather the port, is open to all nations, so the town is no bad epitome of all eastern nations, and presents a more motley assemblage of active and industrious beings than is to be met with at most places. The

population has increased rapidly, and probably amounts to twenty thousand. A fifth part of this population is, however, at Wellesley Point, on the main land opposite. Georgetown is the name of the capital.

This little island lies, as it were, out of the reach of those violent changes of the atmospheric currents, which agitate the regions further to the west. The monsoons are not felt, unless occasionally in a swell of the sea, which, however, rolls mildly, without breaking, and is merely an indication of that more violent weather at some other place, from which the island is exempted. In consequence of this, the weather depends upon local causes; and as the hills in Queda are high, and some of those on the island itself have an elevation of between two thousand and three thousand feet, there are sufficient atmospherical changes for producing an abundance of rain, and violent though brief squalls of wind, although there are no storms deserving the name. The motion of the waters, by the monsoons, and in the channel between Sumatra and the extremity of the Malay Peninsula, produce violent currents of tide, which would be dangerous to small craft, among the rocks and islets, but which do not affect the shipping in the harbour. January and February are the hot and dry months, and the two months imme-

diately preceding have the heaviest rains. The other parts of the year are showery, and well calculated for promoting the growth of vegetation.

The climate is temperate, considering that the place is so near to the equator. As the sun is for some time hid behind the mountains of Queda, the mornings at Georgetown are cool; and even during the heat of the day, the temperature on the plain seldom exceeds ninety degrees, while on the mountains it is at least twelve degrees lower. It is probable, however, that the mild temperature depends in a great measure upon the evaporation occasioned by the woods, and that when they are farther cut down, the heat will become much greater. The fertility seems also to be very much dependant on the same causes; for the soil has diminished on the parts that are cleared. Thus, if the management of the people be not judicious, their island, fine as it is at present, may ere long be converted into a comparative desert. As is the case with the south of India, and the interior of Ceylon, the rock in Prince of Wales's Island is of the granitic formation, generally, we believe, of sienite. The only metal hitherto discovered is tin, of which the ore is not very abundant or rich, neither is it very accessible.

Though the Malays give it the name of Betel-nut Island, there are no areca palms upon it, the larger vegetation being forest trees. One plant in those forests is worthy of notice: the elastic gum vine, or caoutchouc tree (*urcela elastica*), the juice of which forms the common Indian rubber. That plant consists of a stem nearly round, and about three or four inches in diameter, with an ash-coloured rough bark. It creeps along the ground, putting out roots at short distances; and will sometimes extend in this way for a length of five hundred feet; but when it comes to trees, it climbs the stem, and ultimately ramifies itself among the highest branches. The juice, when fresh drawn, has the appearance, and also many of the chemical properties, of animal milk. It is obtained either by bleeding the vine, or by cutting it in pieces; and the quantity is so great, that an old plant, treated in the latter way, will produce nearly two-thirds of its weight. As a portion of the main land of India has been ceded to the Company by the King; as he is frequently annoyed by his neighbours of Siam; as he has become a pensionary of the Company, for the islands and the other land; and as the usual progress has been, "once a pensionary and soon a dependant," the same may, if the influence of the Company continues in the east, be the

fate of the sovereign of Queda; and the dominions of the Company, which already extend as far south of the eastern peninsula as eleven degrees of latitude, may be continued about four hundred miles farther, to Prince of Wales Island, which would be one decided step toward the acquisition of the whole peninsula.

SINGAPOOR.

This, though but a recent, and consequently yet only a small settlement, is, in a commercial point of view, one of the most important in the east, being central to the trade of India, the Eastern Archipelago, and China, and, in fact, one of the best situations in the world for a great entrepôt of oriental commerce. Singapoor is almost immediately under the equator, its latitude being only one degree fifteen minutes north. Its longitude is one hundred and four degrees east; and it lies on the extreme point of the Malay Peninsula. It is situated on a small island, and completely commands the Strait of Malacca, as a cluster of islands and coral reefs, which project from the opposite shore of Sumatra, bring the channel within four miles of the town. The island, or rather the cluster of islands, for there are many banks and coral reefs, separated by lagoons of salt water, is not very large; and a considerable portion of

it is covered by sand, or by pools of stagnant water, some salt and some fresh; but where the soil is susceptible of supporting vegetation, its fertility is very great. Sand-stone and breccia are the principal rocks, and the former is in many places decomposed, and formed into downs, behind which the water stagnates. The interior of the island is much diversified with hills and dales, finely wooded, and abounding in water of excellent quality.

Notwithstanding the nearness to the equator, the great evaporation that must take place from the marshes, and the rapid decay of animal and vegetable substances, Singapoor is neither so hot nor so unhealthy as one would be led to suppose; and it forms in these respects a remarkable contrast to the pestilent marshes on the low lands of Java. This is easily accounted for by the difference of their position. The sea and the atmosphere, on the north of Java, are hemmed in between Java on the south, Sumatra on the west, and Borneo on the north, and heated there as in a cauldron; while at Singapoor, there is a continual play and change through the Strait of Malacca, and to the mountains in Sumatra on the south, and the Malay Peninsula on the north: so that whatever miasmata are raised from it, are instantly dissipated. With this healthiness, where all around

is questionable, the power of its climate, and the advantages of its situation, Singapoor wants only proper government to become a most important and valuable place.

If we may judge from the progress that it has made in population, this seems to be the feeling of the orientals. When the treaty was concluded with the native tomagory, or chief, in 1819, the whole population did not amount to two hundred. In ten years, counting from the rate of increase for the greater part of that period, it must have augmented more than one hundred fold, as it became at least twenty thousand. Great part of the population are Malays and Chinese, who, under proper regulations, are the most active and industrious people in the east,—the Chinese in particular, who emigrate to it in great numbers, the passage from China being very moderate, and as, from the great resort of shipping they find abundant employment. Much cannot be said about the productions of a place which has been so recently occupied; and probably there never will be much produce beyond refreshments for the shipping. But in every part of the world, from Spitzbergen to the line, there is something that is useful to man; and until it shall be ascertained what may be the value of the vegetation of the land, the sea

in the meantime offers its vegetation as an article of trade. The sweet sea-weed (*fucus saccharinus*), to which the Malays give the name of *agar-agar*, and which is, like many other productions of the sea that are neglected by most nations, of considerable importance in China, furnishes a crop to the industrious population. This fucus is remarkably succulent, and may be decomposed into a jelly, in which state the Chinese use it as glue, and as a size, in many branches of the arts. It grows upon the rocks and coral reefs, from which, in favourable seasons, at least a million of pounds may be collected. Like Prince of Wales' Island, Singapoor is a free port, and the regulations are liberal and judicious; while water is abundant, and of very pure quality; and the port dues very moderate. By the latest accounts, it appears that pepper and coffee are among the most promising productions of the soil.

ANDAMAN ISLES.

These are a group of islands, lying in the eastern part of the Bay of Bengal, south-west of Cape Negrais, the south-west part of the Burmese dominions, and having in all the intermediate space a chain of islets, reefs, and banks, upon which there are soundings; indeed the summit of a sub-marine ridge may be traced

all the way from the above mentioned cape to the island of Sumatra, and thence to a vast distance over the Pacific. It is partly owing to the resistance which this ridge offers to the roll of water from the Indian Ocean into the Bay of Bengal, that the monsoon is less violent to the south of Cape Negrais, than to the north, Andaman's isles extend from about 10½° to 13¾° north latitude, and their mean longitude about 93°. There are are two principal islands, Little Andaman, and Great Andaman. Little Andaman lies farthest to the south, and extends about twenty-eight miles from north to south, by less than twenty across. Great Andaman lies about thirty miles farther to the north, and is about one hundred and forty miles long, but not more than twenty broad. It is in fact three islands, being crossed by two very narrow straits.

The surface of the Andamans is very diversified, and Saddle Peak, on the larger island, rises to the height of two thousand four hundred feet. They are clothed with thick forests of timber, and the scenery is in some places grand in the highest degree. The temperature is rather moderate; but the climate is exceedingly unhealthy; and the British settlements that were once made upon the islands, had to be abandoned, as unfit even as a residence for

convicts. The weather is very stormy, as the south-west monsoon beats upon the islands with all its fury for nearly eight months of the year. The surface is accordingly torn in pieces by torrents; and as the humidity is favourable to vegetation, the whole presents a succession of frowning woods and frightful chasms.

The people are suited to the climate and the weather, being, in their appearance, their habits, and their language, different from every race by which they are surrounded. In many respects, they bear a considerable analogy to the native Australians; and probably they all belong to the same negro stock, of which remnants are found in the interior of many of the countries of which the shores are now possessed by the Malays. They have the dark complexion, the large head, and the slender limbs of the Australians, and they are, like them, in the very lowest state of savageism. Their huts hardly deserve the name; they are without vessels for cooking; they cultivate no vegetable; and pick up their scanty living upon the sea coast, where they are dexterous in spearing fish, though, from the violence of the sea, they must suffer greatly in the stormy months. Their chief weapons are bows, strung with fibres of trees or slips of bambû, and they have some bows seven feet

in length, which they draw both by the hands and the feet, and thus discharge their arrows with the whole force of their body. Ptolemy, and the elder geographers, described them as cannibals, and more recent writers have spoken of their huts as being decorated with the skulls of their enemies; but such of those huts as have been examined, and they were upon the smaller isles, where the people seem to be a little more civilized, were decorated, not with human skulls, but with those of a small hog.

The timber of the island is said to be valuable, but there is not any good description of it, and the mineralogy is wholly unknown. Both in the land and the sea there seem to be considerable resources; but the natives cannot avail themselves of these, and others are deterred by the climate; so that Andaman's Isles form a little section in the geographical description of the earth, and nothing more—until philosophy (and it will not be an easy or probably a satisfactory task) shall trace the origin and history of the race of which their inhabitants appear to form a part; and then they will be important in the natural history of man.

CANTON.

Though the present connexion of the British with China be nothing more than a permission

to trade, yet a sentence or two, descriptive of the place to which this permission is confined, may not be altogether improper, as a close to our brief notices of the mere localities of India.

Macao is the first part of the Chinese territory that is reached on approaching the river. It is a small peninsula, occupying the extreme south of an island of considerable magnitude. This small portion of ground, with the town upon it, is the (nominal) property of the Portuguese. Its length is nearly a mile, and rather less than half a mile in breadth. It is connected to the larger portion of the island by a long neck of sand, not more than one hundred yards across, over which the Chinese have constructed a barrier wall which extends into the water on each side; and there is a guard at the gate. No foreigner is suffered to pass this barrier; and the object of the gate is to allow the Chinese to send in vegetables and other provisions to the town, which, as they can stop whoever they please, places the inhabitants at all times completely in their power. Macao is situated upon uneven ground; and the inner harbour, which however admits only vessels of small burden, is in a sort of bend between the elevations. The buildings in the town are of stone, in the European fashion; but

the streets are narrow and irregular, and there is an excess of convents, churches, and other religious buildings. There are several forts, upon which many heavy guns are mounted; but the garrison is small. There are factories in Macao, to which the agents of the different states that trade to the Canton river, retire when the trading season is over. The persons connected with these factories are indeed the chief supporters of the place, since the falling off of the Portuguese trade and influence in the east. The whole population of Macao, within the barrier, may be stated at about fifteen thousand, of which the Portuguese form less than one third. The offing below Macao is much infested by ladrones, or pirates, so that boats are not safe at any considerable distance from a ship. The anchorage at Macao is about five miles from the town.

Lintin, about thirty miles above Macao, and without the bars of the river, is the anchorage for armed ships, which are not allowed to proceed higher. This anchorage, which is under an island, is not very convenient, as provisions have to be brought from Macao, and the water is not good. A few miles above Lintin is the Bocca Tigris, or first bar on the river, which can be passed with safety only during the day. Ten miles above this is the second bar, and there

are also shallows in the passage between, so that the ships have often to be towed, and those which are descending do not complete their cargoes till they have passed the second bar.

The anchorage for merchant vessels is at Whampoa, about sixty miles above Macao. There are many islands in the river at this place, upon which sheds are built by the natives, and let out, for landing the rigging and stores of the ships, and on some of those islands part of the crews are allowed to land for amusement on the Sunday evenings.

A little farther up, the river contracts; but still, at Canton, it is broader than the Thames at London; and though the accumulation of craft upon the Thames be great, that upon the Canton river is still greater; and, besides the vessels that are riding there, or moving upwards or downwards, there are very many families that have taken to the water as a permanent habitation. Among all this crowd there is, however, a wonderful degree of regularity; and both intercourse and business are carried on with more apparent facility than in European rivers and harbours that are not half so crowded. The European factories, of which the English is the largest and most handsome, are arranged along the banks of the river with-

out the walls of the city; and in the neighbouring suburbs there are shops, in which all sorts of commodities are exposed for sale during the day; but in the night the Chinese retire within the walls of the city. The more completely to ingratiate themselves with the sailors, with whose foibles and frailties the wily Chinese are well acquainted, these shopkeepers have English sign-boards, and English advertisements in their shops; and though they often lose sight of what in other countries would be accounted honourable dealing, they never lose their tempers. The trade from Canton is really immense; but it is well regulated on the part of the Chinese. It may be regarded as made up of four separate branches. First, the Chinese trade in their own junks, some of which are of six hundred tons, over the whole of the Chinese sea, from the Straits of Malacca to Japan; secondly, the trade of the western states, other than Britain, of which that of the United States forms a separate branch; thirdly, the country trade with India, which is carried on from the Presidencies; and, fourthly, the trade of the East India Company to Britain, by which alone the produce of China is, under the charter, brought to this country.

But, though the trade with Canton be very extensive, and of very great consequence to this

country, it has no further bearing upon the consideration of India, or of the Indian question, than as it forms the branch upon which the Company appear to have the greatest profit, and, consequently, to the enjoyment of which they adhere with the greatest pertinacity.

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